AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Vol. XLVIII Number 2 | PUBLISHED WEEKLY AT 239 WEST 39th STREET NEW YORK, JANUARY 11, 1923 | Thirty-five cents a copy Three dollars a year

a great deal of thought to the question of which particular one is most important in creating the initial favorable impression upon which so much depends.

It is our belief that this first impression - so important in making the final sale - depends upon the prestige of familiar names more than on any other one thing.

Proofs of performance, durability, economy, must be there; but to get the prospect in the favorable mood where he wants to hear of these, his interest must first be aroused by names that he knows.

Advertising has created a consumer demand for products which the jobber, and the wholesaler, and the retailer have to recognize.

From our experience in advertising Timken Bearings, we believe that this holds especially true in the Automotive Industry. For many years Timken Bearings have been advertised nationally and extensively - and naturally we've watched the results of this advertising pretty closely. Here's what we've found out!

Automobile buyers in ever-increasing numbers are not only accepting the mention of the one word TIMKEN as a satisfactory answer to the bearing question - but they are taking it as a guarantee that other and less well known parts of the machine are of equal quality.

It is a fact that Timken Bearings in transmissions and axles make an automotive vehicle just so much more easily sold. And right there, if your units are equipped with Timkens, you have an important, far-reaching, vital, sales point.

Very truly yours,

THE TIMKEN ROLLER BEARING COMPANY

Entered as second-class matter Jan. 7, 1903, at the post office at New York, N. Y., under Act of March 3, 1879.

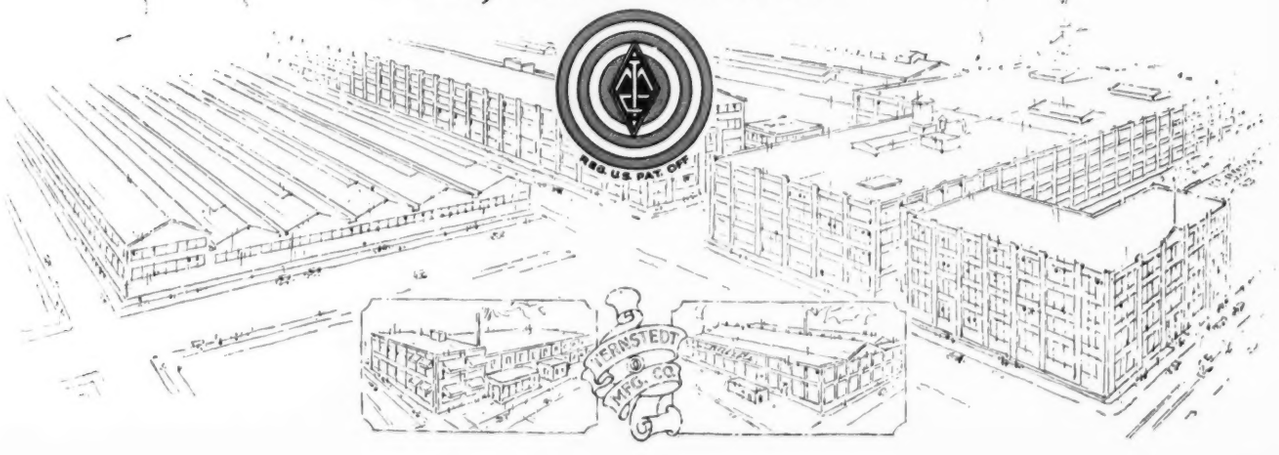
Organization

At Ternstedt, organization is splendidly expressed. Aggressive, clear-visioned executives, working shoulder to shoulder with trained, intelligent workmen, have built an institution, first in rank among producers of automobile body hardware. A higher standard of manufacture—greater economy of production—have been achieved. But the result most treasured of all is the confidence manifested by Ternstedt patrons in Ternstedt products and men.

TERNSTEDT MANUFACTURING COMPANY
6307 West Fort Street Detroit, U. S. A.
Division of Fisher Body Corporation

TERNSTEDT

Largest Manufacturers of Automobile Body Hardware in the World



AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLVIII NEW YORK—THURSDAY, JANUARY 11, 1923 NO. 2

New Merchandising Era Dawns with New York Show

Real selling appeal foundation upon which entire exposition rests. With production methods perfected salesmanship becomes most insistent cry of industry. New models built to meet public's fancy. Outlook bright.

By James Dalton

MERCHANDISING is the foundation upon which the 1923 New York automobile show has been built.

Looking at the exposition from this viewpoint, it is significant of the dawn of a new era. Production methods have been brought measurably close to the goal of perfection and now manufacturers have begun to give more serious attention to salesmanship.

Production is being bent to meet merchandising needs more than it has been in the past. This fact is evident in the products of the industry featured at the exposition. Low-priced closed models, fully equipped open "sport" types and inexpensive sixes, are to be found in a surprisingly large number of exhibits.

The day is gone when a manufacturer will try to sell the public what he thinks the public ought to have. He is striving now to turn out what he thinks the public wants.

Merchandising appeal in the show is an augury of what the year will bring in the industry. It is realized that competition will be keener than ever and that the profits will be reaped by the best merchandisers. This will be true especially in what may be called the second division. The big production companies which will get the lion's share of business will engage in a hot contest for sales, but it is the smaller concerns which will have to fight hardest to keep their heads above water.

One after another, factory executives, presidents and sales managers were asked to express in one word the big feature of the show. "Merchandising"

AUTOMOTIVE INDUSTRIES presents in this issue a complete picture of the annual New York show.

The importance attached to merchandising effort is outlined in this article. Other phases of the show, handled in greater detail, will include:

A critical engineering survey by Henry M. Crane and Herbert Chase.

Changes in chassis design by P. M. Heldt.

Changes in engine design by A. Ludlow Clayden.

Changes in body design by George J. Mercer.

A description of new models, not heretofore discussed in detail, by J. Edward Schipper.

A discussion of what is new in the parts field, by P. M. Heldt.

was the unanimous reply. Sales and service were in the air. Salesmen in the various booths had lost much of the superciliousness which has characterized their attitude toward the public in previous years. They were looking for prospects and were not only willing but eager to talk about their products.

It seemed that a greater effort than usual had been made to gratify the public desire to see the wheels go round and there was a stripped chassis in many exhibits with one or more men to explain the mechanical and engineering details. They didn't have to answer many foolish questions, either. A surprising degree of familiarity with the "insides" of a car was displayed by most of the visitors to these displays.

Public Is "Motor Wise"

The adage that "the American public is becoming motor wise" should be changed to read "has become."

This willingness to lay bare the inner secrets of motor cars gave proof that manufacturers have nothing to fear from the most searching examination in this respect. It also indicated that they are going to devote more attention in future to selling on its merits a perfect piece of mechanism which will give the buyer what he wants in the way of economy and dependability.

Price was a negligible factor as compared with last year. There were comparatively few changes, either up or down, and such revisions as were made, with very few exceptions, were comparatively small. While there was an orgy of price changes in 1922 and the industry was alarmed lest they would make impossible any effort at stabilization, neither the public nor the manufacturers now seem much concerned about value.

Prospective buyers know they are getting their money's worth and that there is more dollar value in motor vehicles than ever before. Consciences of manufacturers are clear for they know their profits are as low as they can make them in justice to themselves. When slight upward revisions are made they will be due entirely to added equipment or higher cost of materials.

While few changes have been made in the prices of standard models, there is a strong trend on the part of most manufacturers toward a low-priced line to sell with the lines previously made. This will help them get their share of the enormous volume of business in the low-priced field and it also will help them keep their dealers satisfied. Addition of inexpensive models may make an exclusive dealer out of one who hitherto has handled the products of two or three makers.

Let it not be forgotten, either, that the dealer is looming exceedingly large on the manufacturer's horizon. That is one highly important phase of the merchandising at the show. Car makers are trying to sell themselves and their products to the men on the firing line who are themselves real merchandisers.

While all manufacturers are striving harder than they ever did before to expand their sales organizations, they are not seeking quantity alone. They want quality as well. A good many sales managers have new stories to tell. In recruiting dealers they have abandoned the idea that they must of necessity take on men who previously have sold automobiles. They would much prefer to train a man who knows little about motor cars but much about salesmanship than one who knows all about automobiles, but is an indifferent merchandiser.

More than one sales manager said he was making valuable dealers out of merchants who previously had sold hardware and insurance. This merely indicates what can be done in finding dealers in other fields.

There is mighty little this year of the "let the dealer look out for himself" attitude which has characterized some factory sales departments in the past. Ask any of them what they are doing to help their dealers and you'll get an enthusiastic response. They have revised, revamped and improved the old methods which have had genuine value and they have seized eagerly all the new ones they could get their clutches on.

Factories know better than they ever did before that the dealer has troubles of his own, that he is not making enormous profits regardless of how good a merchant he may be and that their own business can't prosper unless they have a good sales organization in the field, no matter how good their products may be.

Two or three trends in relation to dealers are apparent at the show. One is toward a greater number of direct factory contracts, another toward dealer contracts more advantageous on points other than discounts and another toward abandonment of the system of cutting territories up into small chunks. Efforts of all kinds are being made to help them finance themselves. There is gratifying evidence that banks are more friendly to strong and efficient dealers.

Intensive Selling Policies

Most striking of all, although more or less elusive, is a swing on the part of the smaller companies toward a localization of effort. A few of them don't laugh at you now when you suggest that it might be profitable to cultivate smaller territories. Two or three even agreed that the suggestion was sound and said they proposed to take the step just as soon as they could.

Statistical Picture of Seven New York Shows

	1917	1918	1919	1920	1921	1922	1923
Total exhibitors	323	331	198	307	307	337	356
Total car exhibitors	...	...	...	...	86	87	78
Total accessory exhibitors	227	252	141	225	221	250	278
Gasoline car exhibits	...	...	...	...	83	83	76
Electric car exhibits	...	...	...	...	3	3	1
Steam car exhibits	...	...	...	...	...	1	1
Total vehicles	338	301	225	334	377	346	325
Total gasoline cars	272	252	223	324	334	302	278
Total steam cars	2	4	...	2	1	2	2
Total electric cars	10	11	2	8	7	6	3
Total stripped chassis	54	34	...	...	35	36	42
BODY STYLES (Gasoline and Steam Cars Only)							
Open cars	195	175	127	176	163	158	127
2-3 passenger	68	40	...	...	40	29	14
4-5 passenger	140	143	...	...	91	102	92
6-7 passenger	140	143	...	...	32	27	21
Closed cars	37	77	79	119	120	149	155
2-3 passenger	6	13	...	...	23	37	19
4-5 passenger	...	43	...	...	80	80	101
6-7 passenger	19	8	...	...	27	32	35

ENGINE CHARACTERISTICS (Gasoline Cars Only)	1917	1918	1919	1920	1921	1922	1923
Water cooled	...	...	...	...	325	318	315
Air cooled	...	...	...	...	7	8	6
Four cylinder	146	94	40	65	80	84	83
Six cylinder	161	171	141	223	213	204	199
Eight Cylinder	55	40	34	29	31	41	37
Twelve cylinder	16	9	8	7	3	2	1
Poppet valves	270	252	...	...	321	319	307
Sleeve valve	2	...	...	...	12	8	12
Revolving disc valve	...	...	...	...	1	1	1
"L" head	...	...	...	...	180	206	209
"T" head	...	...	...	...	29	15	12
Valves in head	...	...	...	...	119	86	83
Valves in head and side	...	...	...	...	...	...	16
WHEELS (All Cars)							
Artillery	...	...	...	...	215	229	235
Wire	...	...	...	...	70	67	21
Disc	...	...	...	...	56	37	71

Thoughtful executives, both those of the larger and smaller companies, admit that the time has come when scientific methods of salesmanship will win. They are telling their dealers how to make scientific analyses of the sales possibilities in their territories. Factory sales departments are setting the pace in this respect. They are abandoning rapidly the old hit or miss system which worked well enough when there were millions of prospects who never had driven a motor car.

With more than 12,350,000 motor vehicles in use in the United States, however, it is becoming axiomatic that the replacement market is much more important than the new market. When such a condition prevails it is the meritorious product sold on the soundest and most efficient lines which will win.

Manufacturers at the show profess to feel no fear whatever over the business outlook for the next six months at least. They don't display foolish exuberance but they do radiate calm confidence. Their dealers in most sections of the country are entirely satisfied. They had a splendid December business and they have a record breaking number of orders on their books for early spring delivery.

1923 Prospects

While it is felt that sales for the first half year, at least, will be good in all sections of the country, it is expected that business will not be uniform. Generally speaking, sales managers expect trade to be best on the Atlantic and Pacific coasts and in the South, particularly Texas. They look for a good farm business, but are not quite so hopeful of the exclusively agricultural States. They will make careful surveys of the sales possibilities in the doubtful States so that dealers will not be pressed to take more cars than they can reasonably be expected to sell.

All exhibitors at the show last year watched the crowds on the opening day eagerly and anxiously. They were hopeful that they were standing on the threshold of a big year, but after the long period of depression they were not sure of it. They naturally were highy gratified when the attendance broke all records.

It was undeniable that the attendance on the opening day this year was a bit disappointing, but this fact caused no apprehension. Reports from dealers show that fall and early winter business has been unprecedentedly good. Actual orders booked for early spring insure a strong demand and there was not so much concern about the crowds at the show.

Crowds Smaller

Even if the crowds later in the week do not measure up to last year's proportions it will be easily explainable. The New York dealers' association staged a very successful closed car show in the fall and they were able to show many new models. Therefore there was less curiosity than usual about what would be seen at the national exhibition. Another factor is that many prospects already have determined what particular car they are going to buy.

From the standpoint of engineering and design the show is fully equal in interest to any of its recent predecessors. Several important new lines are displayed, either at the Grand Central Palace or in hotel lobbies. They include the new copper-cooled Chevrolet, the Chandler, the Flint, which is the latest Durant creation, the Stutz Six, the Premier Four, the new National line of sixes, including the lowest priced six on the market; Mercer Six, Apperson Six, Dort Six, H.C.S. Six, Auburn Light Six, Stearns-Knight Six, Handley-Knight, Courier, Apperson Four, R. & V., Kissel, Haynes and Chalmers. Nearly every maker has brought out some new body model.

There is a marked increase in the number of sixes on display, but there have been few striking changes in engine design. The Chevrolet copper-cooled probably is the most notable.

New Chassis Models Shown by Thirteen Makers

Chandler, with Ricardo type combustion chamber, six cylinder Stutz, H.C.S. and Apperson cars, low-priced National and Premier, and seven other new design jobs make first appearance at Show.

By J. Edward Schipper

MORE new cars than usual appear at the Show this year. Models exhibited for the first time are shown by thirteen manufacturers, and practically everyone has one or more new body types. Nearly all of the new bodies are sport models either in the open or closed form. These differ from the standard types more in paint and equipment than in actual body form. The addition of bumpers, rear view mirrors and other equipment, which is not as a rule included in the purchase price, a variation in the way of painting, and the use of nickel for the radiators, lamps and windshield brackets, generally comprise the difference.

Some new car chassis are shown which will not be in production for some time. Chandler has chosen to make its first appearance at the show with a completely redesigned chassis incorporating a number of features of engineering interest. Stutz and H. C. S. exhibit their new sixes and Chalmers has its new line, altered in chassis and body detail to bring it thoroughly up to date. Another new chassis of interest is the Stratton-Premier, a small four intended for big production and to sell at a low price. Other new chassis exhibited for the first time are National, Apperson, Auburn, Hatfield and Kissel. Other concerns such as Overland are showing complete new body lines.

Engineering Changes in Chandler

The new Chandler chassis is equipped with a redesigned powerplant. The bore and stroke, 3½ by 5 in., remain unchanged, but there have been numerous improvements for better performance. By re-designing the combustion chamber it has been possible to increase the compression from 71 to 84 lb. The new combustion chamber is very nearly the Ricardo type. The piston comes very close to the head over a considerable part of its area, while the clearance space approaches the hemispherical in form with about one-half the volume directly over the valve in the L. The valves are slightly inclined, with the result that

considerable turbulence is created at the time of ignition. Marked freedom from detonation is claimed as a result of this design.

Some alterations have also been made in the construction of the engine. The cylinders are now being cast in block. The crankshaft is 20 lb. heavier than in former models and has four bearings instead of three. The entire crankshaft support has been stiffened, the main bearings being bronze backed, the camshaft and crankpin bearings increased in size and the crankcase made stiffer. The front end drive is by a single Morse chain, adjustable from the outside. An increase has been made in the radiation surface and the cooling fan now has six blades. The oil pump is more accessible, being of the gear type bolted to the left side of the crankcase. The crankcase drain plug has an extension which permits draining the crankcase without getting under the car.

Some anti-rattle features have been incorporated in the chassis, particularly on the spring shackles and on the brake equalizer bar. The shackles are built with heavy coil springs in cups so that the proper tension is automatically maintained. By re-designing the steering gear and linkage the turning diameter of the car has been reduced from 44 to 39½ ft. The crevices on the tie-rod have been replaced by ball joints to make steering easier, and taper roller bearings have been put in the steering spindle. On the new model the battery is placed on the right side with all the rest of the electrical equipment, and the exhaust is on the left.

Changes in appearance have resulted from the addition of ¾ in. to the height of the radiator, which has also resulted in the increased radiation area formerly mentioned, and the shape of the shell is somewhat different, although the distinctive Chandler outline has been retained. A new body model, the semi-sedan, is shown for the first time. It is a two-door, five-passenger body with tilting front seats. It lists for $1,695.

Stutz Overhead Valve Six

Stutz has added a six-cylinder car to its line and is exhibiting it for the first time. It is equipped with a 3⅜ by 5 in. overhead valve engine. This is a detachable head unit with block cast cylinders in unit with the upper half of the crankcase. With a formula rating of 27.3 hp. this engine is claimed to develop 75 actual brake horsepower on the block. A speed range of 2 to 75 miles per hour on the standard gear ratio of 4.4 to 1 is claimed on high gear. The phaeton ready for the road weighs 3400 lb.

The overhead valve mechanism is operated by a link belt silent chain through roller followers actuating the push-rods and rocker arms. Lubrication is by pressure feed to all bearings from a gear pump driven off the camshaft. The pushrods operate in channels open to the crankcase, permitting an oil mist circulation about the valve action which assists in the lubrication of these parts. The breather is located above the cover plate over the valve action, the breathing function taking place through the passages in which the push-rods operate. The carbureter is a Stromberg fed by Stewart-Warner vacuum system and cooling is by centrifugal pump, the water being circulated through a radiator with a datachable cellular core.

The drive is transmitted through a single dry plate clutch, Borg & Beck type, to a Warner three-speed selected gearset mounted on ball bearings and through a No. 5140 Timken rear axle providing reduction of 4-5/12, 4-8/12 and 5-1/11 to 1. This axle is provided with 15½-in. brake drum. Great care was used in laying out the brake mechanism in relation to the suspension centers, the claim being made that there is no movement of the brake pedal from full compression to full rebound position of the springs. Springs are set at an angle of 2½ deg. to the road.

Hotchkiss drive through Mechanics universal joints and propeller shaft is employed. The rear springs are semi-elliptic underslung, 62½ in. long with bronze bush eyes. The front springs are 38 in. long. The frame is made up of 7-in. channel side rails with four cross members. Three of these are tubular, 1½ in. in diameter with a 5/32 in. wall. The radiator is mounted on trunnions and the powerplant is a three-point suspended unit.

Care in Chassis Assembly

In the chassis assembly, care has been taken to avoid lefts and rights wherever possible. The running boards, for instance, are pressed steel members interchangeable to either side of the car. The number of nut and bolt sizes has been reduced as far as possible, an interesting example being the nuts which retain the head lamps. These can be removed by the same socket wrench which is employed to take the spark plugs out of the recesses in which they are set in the side of the cylinder head. The fenders, aprons, running boards and a great many of the other chassis parts can be detached without removing any other unit.

Three body styles are put out at present. These are a phaeton, roadster and sedan. All of them are mounted on the standard 120-in. wheelbase and are fitted with anti-skid tires all around. The touring car and roadster use the 32 by 4 in. size and the sedan 33 by 4½ in. The standard wheels are of the 12-spoke artillery type, wire and disk being optional at extra charge.

The phaeton is a five-passenger type with low side panels and high cowl, the flush type door is used with exposed hinges. The dash construction is pressed steel reinforced and sound proof with a wood backing. The upholstery is hand-buffed Spanish leather in French folds over curled hair and coiled springs. The windshields are mounted on integral body coasts anchored firmly to the body structure. The roadster is a three-passenger type also finished in hand-buffed Spanish leather and the tops on both the roadster and phaeton are permanent type of Panorama style without bows from front to rear. The sedan is a five-passenger type upholstered in cloth and equipped with a dome light operating with the rear doors.

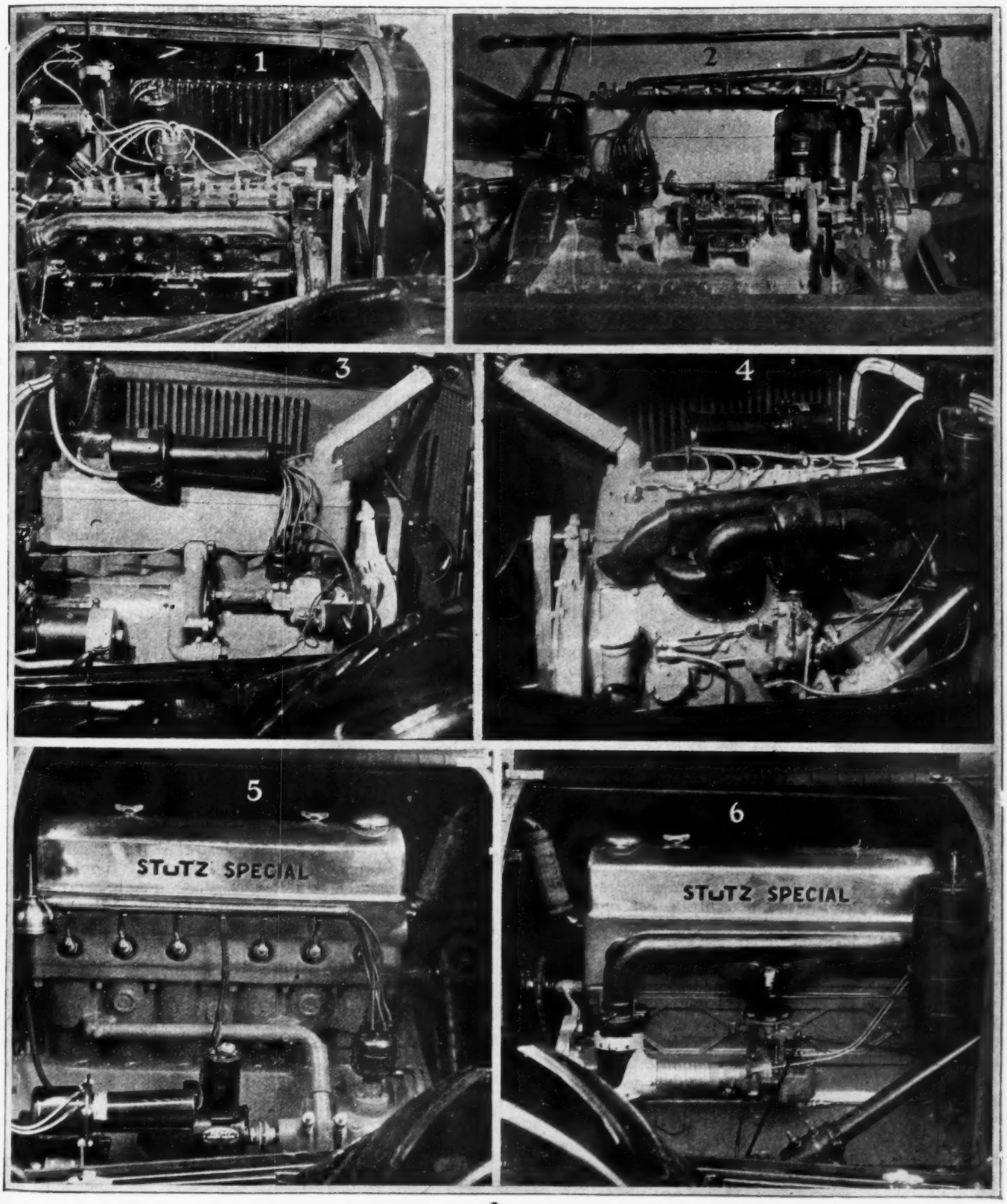
H. C. S. Six Introduced at Show

The H. C. S. line has been rounded out by the addition of a six-cylinder model exhibited for the first time at the show. It incorporates a block cast 3½ by 5 in. overhead valve powerplant, which the makers claim will develop 80 hp. at 2850 r.p.m. This engine incorporates a number of brush design features including the lubricating system, crankshaft and connecting rod bearings and valve action. The valves are Silcrome steel and mounted in a detachable head. They have a diameter of 1½ in. in the clear and 13/32 in. lift.

Lubrication in accordance with the brush design is by full pressure to all bearings, piston pins and rocker arms. Cooling is by pump circulation from a bronze centrifugal pump driven from the generator shaft. The pump is of brass throughout. The radiator is of cellular type with the shell pressed from nickel-silver without plating to assure permanent luster. The fan is a two-blade type of cast aluminum driven by V belt. Ignition is by complete Delco system, with all of the equipment mounted on the right side. Carburetion is by Stromberg 1½-in. unit, which, with the combined exhaust and inlet manifold, is mounted on the left side of the engine.

The engine, dry plate clutch and Brown-Lipe transmission are mounted as a unit plant with four-point suspension. The frame is widened behind the engine to stiffen

Important Powerplant Innovations



1—Engine of new small National. 2—Partially cutaway engine shows changes in combustion chamber of new Chandler. 3—Redesigned engine in new Chalmers line. 4—Modified heated intake manifold on new Chalmers. 5—Water pump side of new Stutz six-cylinder engine. 6—Manifold and carbureter side of new six-cylinder Stutz

the structure. To compensate for any minor deflections there is a spacer shaft between the transmission and propeller shaft with a universal joint. A triangular drive layout is employed, with a ball joint taking the propulsive thrust and radius rods as torsional members.

There is also a thrust rod on the rear axle. This is a three-quarter floating unit with double internal expanding side by side brakes on 16-in. brake drums. The differential is mounted on roller bearings and the axle shaft on angular ball bearings. The wheels are wire. Two extra wheels are mounted on either side of the hood through strong brackets secured to the frame. Goodrich Silvertown cord tires, 32 by 4½ in., are used. Springs are semi-elliptic, the front 2½ by 36 in. and the rear 2½ by 56 in. Canadian steel, thin leaf type. The spring bolts are ¾ in. hardened and ground and fitted with oil cups and wicks for lubrication.

The five-passenger phaeton selling for $2,650 is the only car on the six-cylinder chassis at present. This is mounted on 126-in. wheelbase. The body is a wood frame type, covered with heavy gage steel plates. The door frames are built from one-piece malleable castings. In the upholstery, the Marshall type springs are used throughout. The upholstery is hand-buffed, dual tone leather in a shade to match the painting. A trunk and rack are standard equipment.

Chalmers Adds Bodies and Redesigned Chassis

Three new bodies have been added to the Chalmers line and the chassis units have been revised to provide a stronger frame and improve performance. A new manifold is now incorporated and the cooling system has been redesigned so that it is now by centrifugal pump instead of thermosyphon. The oiling system is now a pressure feed. There are several other detail modifications throughout the chassis at such points as the shackles, frame cross members, etc.

The new bodies include a sedan, sport touring and roadster coupe. The new sedan sells for $2,095. It is mounted on a 122 in. chassis and is equipped with bumpers, trunk and rack, extra tire and extra disk wheel and is upholstered in mohair velvet. Although classed as a five passenger model, it has two auxiliary seats providing additional seating accommodation for seven passengers if desired. The sport car sells for $1,445. It is equipped with nickel radiator, nickel lamps, two bumpers, trunk and rack, khaki top, extra tire and wheel.

New Low Price Premier Four

Premier, which has previously been known as a high priced car, is now in the low priced field and is showing for the first time the four-cylinder Stratton-Premier. The old Premier six-cylinder line will be continued. Four bodies, a phaeton, roadster, coupe and sedan are available in the four-cylinder line.

The four-cylinder engine used in the new chassis has a bore of 3 in. and a stroke of 4½ in. It is an L-head type with the valves on the left side and claimed to develop 23 hp. at 2200 r.p.m. The powerplant is a unit, mounted at three points. The cylinders are cast in block with a detachable head and a barrel type crankcase. The crankcase is open at the bottom with a heavy pressed steel oil pan with a reinforcing flange around the top forming the seal and also permitting access to the interior bearings. The pistons are semi-steel with the rings above the wrist pin. There is an oil collecting groove below the bottom ring which drains to the piston pin, lubricating that member.

The piston pins are clamped in the upper end of the I-beam connecting rod. The crankshaft is a 0.40 carbon steel unit carried on two annular ball bearings with ⅞-in. balls. The valves are driven through a helical timing gearset with 1-in. face gears, 1⅛-in. diameter camshaft carried on three cast iron heads set on an angle so that the piston at the top of the stroke is just level with the valve port. Cooling is by thermosyphon. Electrical equipment is Auto-Lite and the carbureter a Zenith.

The drive is taken through a multiple disk Covert clutch, three speed Covert transmission and two fabric universals to the semi-floating rear axle. The frame is pressed steel 4½ in. in depth of ⅛-in. stock. The springs are reversed quarter elliptic cantilever, placed parallel to the frame side rails. The front are 33 x 1¾ in. and the rear 50 x 2 in. The main leaves are chrome vanadium steel and the remaining leaves carbon steel. Owing to the unusual spring mounting, it is plain that a 138-in. spring base is obtained, although the wheelbase is 102 in. The length of the frame overall is 145 in. The tires are 30 x 3½ in. The wheels are Dayton wood disk. All models have individual steps and fenders and a speedometer and ignition lock are regular equipment.

National Shows Lowest Price Six

New National model listed at $795 is the lowest price six-cylinder car at the show, and is claimed to set a record low mark for six-cylinder cars. This, with two larger models, makes up the line produced by the National Motors Corp., formerly known as the Associated Motor Industries, an amalgamation of the National Motor Car & Vehicle Corp., Kentucky Wagon Corp. and Jackson Motors Corp. The Dixie Flyer and the Jackson cars have been discontinued, their places having been taken by the two smaller models.

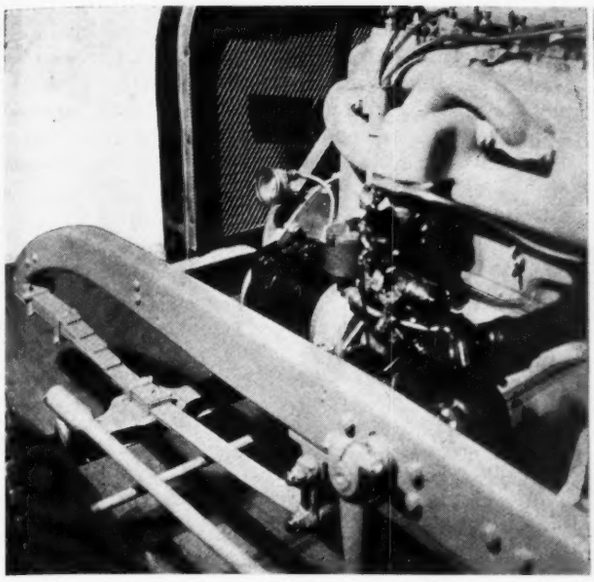
The six-cylinder engine for the small model is cast in block with detachable cylinder head. The cylinder dimensions are 2⅞ x 4½ in. Lubrication is by pressure to the main bearings and cooling by thermosyphon circulation. Stewart-Warner vacuum fuel system is used. The other chassis units include a multiple disk clutch, gearset, universals, axles and steering gear made especially for this car in the plant of the Covert Gear Co., which is owned by the National Motors Corp. The car is geared 4.6 to 1 and the phaeton is claimed to weigh 2100 pounds.

The Model 651 uses the Continental 8R engine, the same as was formerly employed in the Jackson, which this model replaces.

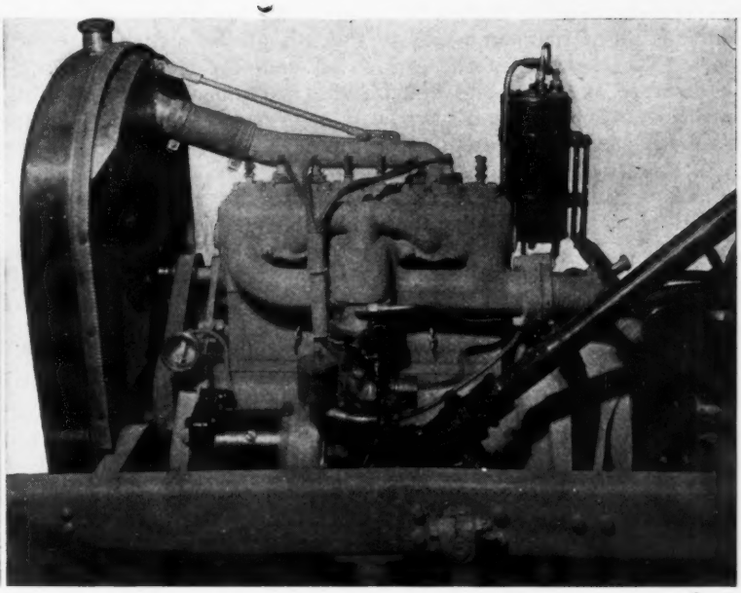
The cylinder dimensions of the engine in this model are 3⅜ in. by 4½ in. Cooling water is circulated by centrifugal pump and lubrication is by pressure to main and connecting rod big end bearings. The carbureter is a Stromberg and the fuel is fed by Stewart-Warner vacuum system. Auto-Lite starting and lighting is regular equipment. The clutch is a Borg & Beck and the gearset is a Covert three-speed type, mounted as a unit with the powerplant. The rear axle is a three-quarter floating type with spiral bevel gears. The front springs are 39 in. long and rear springs 58 in. long. Both propulsion and rear axle torque are taken through the springs.

The frame is pressed steel, the side rails being 5½ in. deep with 2½ in. flanges. There are four cross members. The emergency brake operates on the transmission and the service brake acts externally on drums on the rear wheel. The wheelbase is 121 in. and the tires are 32 in. x 4 in. Wood wheels are regular equipment.

The Model 671 is similar from a mechanical standpoint to the previous National which it supersedes. The frame has been redesigned to secure greater stiffness and a new type of Rayfield carbureter with water jacketed bowl and electrically heated primer is used. The Model 671 is different in appearance from the Model BB, however, because of the new line of bodies. The bodies used on all three chassis models were designed by H. F. Holbrook.



Reversed cantilever front spring on new Stratton-Premier



Left side of Stratton-Premier engine, showing carbureter and manifold arrangement

A feature of the open models is the unusually wide doors. This has been made possible by the elimination of the narrow panel which separates the front and rear doors on most phaetons. This feature also simplifies the design of the side curtains. The hood and radiator design is of the high narrow type and the bodies have a stream line appearance. The side panels are smooth. The open models are fitted with permanent top.

Durant Princeton Chassis

Utilizing some new and ingenious structural features, the Durant Princeton car is one of the show week surprises. It is in the $2,500 class and serves to round out the Durant line. It will be built in the Muncie, Ind., plant, which is all lined up now to produce this new unit.

Primary interest in this new car is in the ingenuity with which the designers have accomplished the result of making a single part perform two or more functions. The muffler, for instance, not only acts as a muffler but also as a tubular longitudinal structural member acting as a chassis backbone and tying together the front and rear center cross members. It is 6 in. in diameter and has a 3/32 in. wall thickness. Inasmuch as this is a four-point suspension job, this member is of considerable importance in contributing rigidity to the frame.

Another unit which performs a dual purpose, is the rear cross member, which performs all of the functions of such a unit and in addition is extended out to form the horns for supporting the back ends of the rear springs.

An Ansted engine in unit with an eight-plate dry disk clutch of Durant design makes up the powerplant. The engine is the standard 3⅜ by 5¼-in. unit which is familiar to the industry. This is fitted with a Rayfield 1½-in. carbureter and Auto-Lite electrical equipment.

The gearbox is a three-speed unit of Warner design mounted amidships. It is separated from the clutch by a short spacer shaft with two Spicer universal joints that fulfill the dual purpose of taking up any deflections in the frame and rendering readily removable either the powerplant or the transmission units. The drive is taken through a Spicer universal and a 15/16-in. solid propeller shaft inclosed in a torque tube.

The rear axle is a semi-floating ball bearing unit geared 5⅛ to 1. It is fitted with 15¼-in. brake drums upon which act the internal and external brakes. The drive is transmitted through the springs, the torque being taken through the tube surrounding the propeller shaft. The rear springs are semi-elliptic 60 in. by 2½ in. bronze bushed. The front springs are 42¼ by 2¼ in. wide. In connection with the front spring mounting the malleable which forms the front spring horn also includes a boss which takes the front bumper, this being a part of the regular equipment.

The frame is built up on two 7½-in. channel members of 5/32-in. stock. It is braced by five cross members and the cylindrical muffler backbone mentioned. The four-point engine mounting also acts as a stiffener and the tank at the rear end is hung in the frame with three-point suspension, the third point being on the rear cross member which also acts as the rear spring hanger. The chassis is in two wheelbase lengths, 128 in. for the open models and 132 in. for the closed. The tires are 32 by 4½ in. on the former and oversize, that is 33 by 5 on the closed cars.

The front compartment is slightly different from conventional in that the hand brake lever is on the left of the driver, this having been done to separate it from the shifter lever which is further back than on the usual type of car with a unit powerplant, because of the amidship location of the gearbox.

There are six types of body mounted on this chassis. These are a seven-passenger phaeton at $2,485, three-passenger roadster $2,485, seven-passenger sedan limousine $3,675, seven-passenger sedan $3,550, five-passenger coupe $3,350, four-passenger open sport $2,585.

Apperson Revises Eight and Brings Out a New Six

The Apperson eight-cylinder line is augmented by the addition of a new six. A great number of refinements are made in the eight and many of the changes shown are also incorporated in the design of the six. Probably the most interesting feature is the use of a mechanical pre-selective gearshift operated by a small lever on the steering wheel and the mounting of the emergency brake on the dash, operating through a pull rod. This leaves the driver's compartment entirely free of levers. In fact there is no more trouble sliding across the front seat than across the rear seat. This feature is used in both chassis. Apperson calls it a leverless gearshift.

The accelerator on both models is a balanced aluminum

plate and the starter button is moved from the floor to a point on the instrument board to the left of the steering wheel. The choke is at the center. A radiator meter of the distance type has the dial on the instrument board. The clock and speedometer have been made separate instruments. A gasoline gage is also on the dash. The steering wheel is entirely walnut except the hub.

All Apperson models now carry the Apperson crest, this appearing on the radiator cap, kick plates and hub caps. The familiar Jack Rabbit now takes the form of a radiator cap ornament. Spark and throttle controls on both models are of the trigger type, the quadrant previously used on the eight having been eliminated.

All the joints in the steering system on both cars are of the ball and socket type, including reach rod and tire rod. This is a total of four ball joints. Provision is made for wheel alignment by simple adjustment at the right end of the tie rod.

New Apperson Six

The engine of the new six is 3⅛ x 4½ with overhead valves. For the present it is being manufactured for the Apperson company. All moving parts operate in a bath of oil and the oil intake is on the top of the valve cover. Circulation of the oil keeps these parts fairly lubricated. Starting, lighting and ignition is Remy and cooling is by thermosiphon. The clutch and gearset form a unit powerplant with the engine. The rear axle is a Timken, semi-floating type with a gear reduction of 4 to 1. Tires are 32 x 4 in. The equipment includes bumper, windshield wings, stop signal, extra tire and tube and rim.

A feature of the six-cylinder phaeton is the use of a permanent top. This type of top is now also used on the eight-cylinder phaeton. It has a step and recess with the curtains fitted to the inside. The fastening to the body is unusually strong and a heavy nickel-plated strap completes the fastening at the forward end of the gypsy curtain.

The equipment of the eight-cylinder models is more complete. It includes an automatic windshield wiper, two spare wheels with tires, tubes and covers, rear view mirrors and, on the open cars, windshield wings which are built into the windshield and not added as an accessory. All models have been lowered, due to changes in the spring suspension and smaller tires, which are 33 x 5 in. The head lamps are of the drum type and are tied together with a rod. The emergency brake is of the gearset type and this same construction is also used on the six. A change in the spring design is in the folding of the second leaf as well as the first around the shackle pins. This reduces breakage to a minimum. Another novelty in design is the use of a double pulley on the fan, the same shaft driving both fan and generator. This gives a more positive drive and prevents a breakdown in case of one belt breaking.

Pistons and connecting rods have been made lighter and the reinforcing ribs have been eliminated from the piston skirts. Another innovation in design is the use of a Thermoid-Hardy universal joint between the clutch and gearset, the fabric disks being reinforced with steel plates. An adjusting nut on the end of the crankshaft provides means for taking up crankshaft endplay.

Radiators are higher and the shoulders are wider and this, together with the decrease in height of the car, accentuates this feature.

Overland Discloses New Line

The new Overland line has the same chassis, powerplant and parts but there have been a number of detail changes, principally in the body arrangement, hood and radiator. The most noticeable change is in the raising of the radiator 1½ in., the raising of the hood and the change in the cowl, which is now brought up practically to a straight line with no noticeable curve. This, together with the elimination of the beads and the change in other curves, gives a real streamline body. The phaeton has larger rear window lights, so that they are really of service to the driver. The seats have been lowered and there is more legroom in both front and rear compartments. The doors are wider than before and it is possible to get into the driving compartment from the left side of the car without crowding. The changes noted in the phaeton are also incorporated in the roadster.

The new sedan and coupe have the same radiator, hood and cowl changes and in addition many improvements have been made in the car interior. The upholstery has been changed and the color is a slate. All models have drum type headlamps which are not only bolted to the fenders but have a tie rod between them as well. A new type radiator cap also improved the appearance of the line. The front splasher and front end of the fenders have been slightly changed to eliminate rumbles and anti-squeaks have been added to the runningboard splasher, body and frame. All bodies are bigger and wider than before. The top and clear vision windshields have been lowered 2 in. The phaeton body is all steel with baked enamel and detachable upholstery. A change that was made some time ago is the placing of the spark and throttle control levers under the steering wheel instead of on the dash. This change will be continued in the new models. The prices on the open models remain the same as before, but the sedan has been reduced to $860 from $875.

Auburn Shows Two New Chassis

Two new Auburn chassis are shown, the 643, which is a smaller model than the previous line, and the 663 which is a larger model. The present model is continued.

The new 643 is on a chassis with a wheelbase of 114 in. The engine is 6-Y Continental, 3⅛ x 4¼ with Borg & Beck clutch and Warner gearset. The carbureter is a Stromberg and the emergency brake is on the driveshaft at the rear of the gearset. Both front and rear axles are Columbia and the frame is 6 in. deep.

Model 663 has a wheelbase of 122 in. The engine is an overhead valve, 3¼ x 5 in. with a full pressure lubrication system. The carbureter is a Stromberg, starting, lighting and ignition is Remy, clutch is Borg & Beck and gearset is a Warner. Columbia axles are also used on this model and the emergency brake is of the transmission type. The tires are 32 x 4 in. and the equipment includes a Boyce Motometer with a locking bar cap and windshield wings that open and close with the curtain.

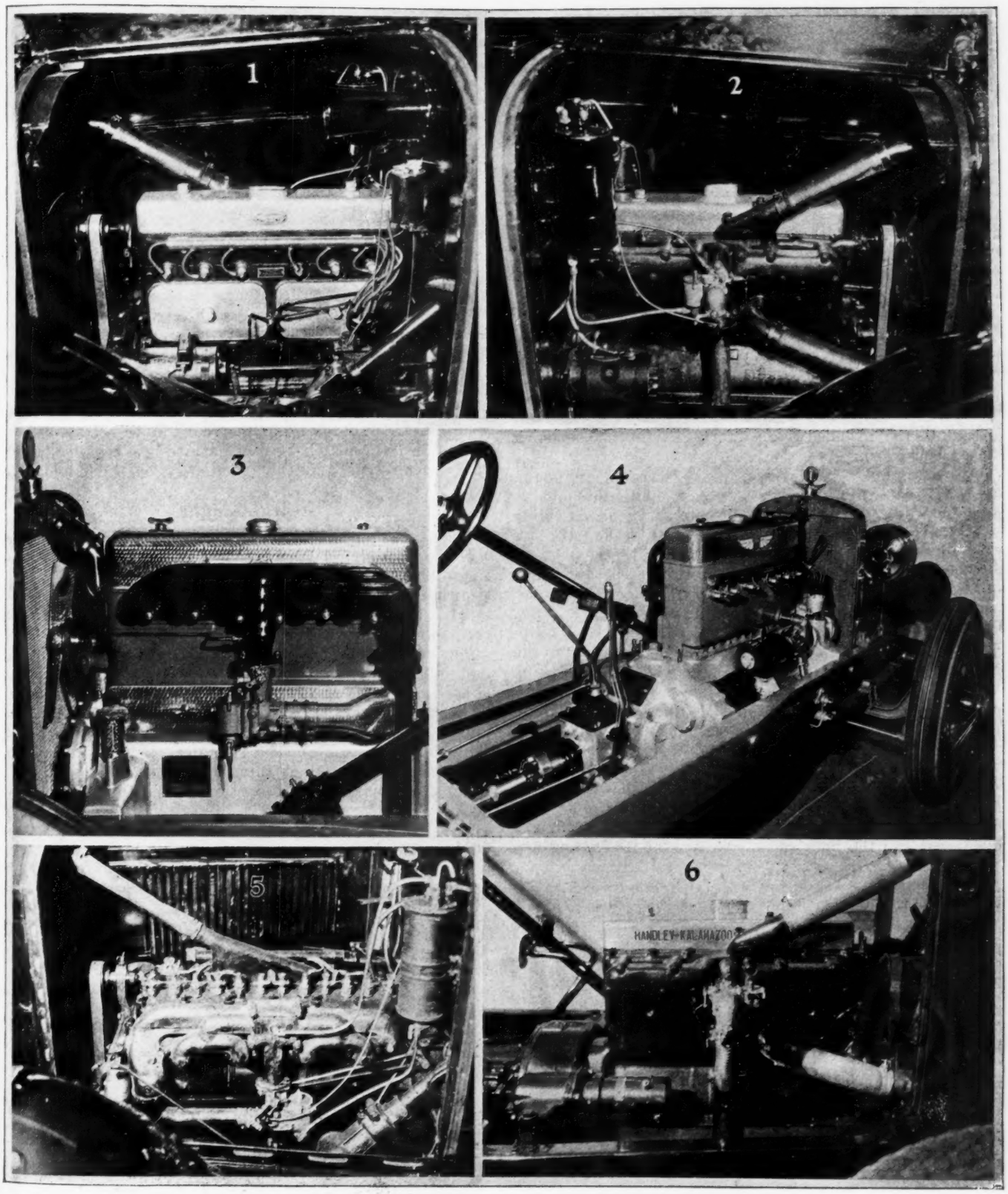
Hatfield Shows a New Six-Cylinder Chassis

Hatfield is now building a 6-cylinder model, the first three completed models of which are exhibited at the show. This model is known as the 655. The 4-cylinder line is continued without change.

The engine is a Herschell-Spillman, 6-cylinder unit, 3¼ x 5 in. It has aluminum pistons, is 3-point suspended and of the unit power plant type. Water circulation is by a centrifugal pump and the radiator is of the cellular type assisted by a ball-bearing mounted fan with eccentric belt adjustment. Equipment includes Stromberg carbureter, Bosch starting, lighting and ignition, Borg & Beck clutch, with 10-in. disk, Durstin gearset, Spicer universal joints and propeller shafts, Columbia front and rear axle, the latter being of the full floating type, Sheldon springs and Gemmer steering gear. The tires are 32 x 4 and wheelbase 121 in.

All coach work on both 4 and 6-cylinder models is done at the Hatfield factory. The new 6-cylinder line includes

New Engines Make First Appearance



1—Left side of Apperson powerplant. 2—Carburetor and manifold side of Apperson engine, showing location of water cooler. 3—Intake manifold on new H. C. S. six-cylinder engine. 4—Four-point suspension used in mounting new H. C. S. six-cylinder powerplant. 5—Manifolding arrangement on Auburn. 6—Right side of new Handley engine; note unusual fan shape in radiator

Flexible fabric shackle employed on new Handley chassis

New rear spring shackle employed on redesigned Chalmers six-cylinder chassis

a 5-passenger sedan, $2275; 4-passenger coupe, $2175; 5-passenger sportster, $1975; 4-passenger sportster, 4-passenger sportster, $925, and 5-passenger phaeton, $1775.

Handley Brings Out Poppet Six

Handley shows two entirely new chassis having overhead valve engines. The Knight engine is discontinued by this company. The two features of the small chassis from an external viewpoint are the fabric spring shackles and an extremely deep V type radiator with a fan built close into the included angle of the V, the blades being sloped backward.

The engine is a unit power plant with six cylinders, 3⅛ x 4¼, cast in block. The cylinder head is detachable and the valves are overhead and operate in oil. Cooling is by thermo-siphon system. The service brake is on the rear wheels and the emergency, in back of the gearset, on the propeller shaft. Drive is of the Hotchkiss type. The springs are semi-elliptic. The fuel is carried in a 15-gal. tank at the rear, fed by vacuum system to the carbureter. The clutch is of the dry plate type. The electrical equipment is of the 2-unit type with ground return and the ignition has an automatic cutout. The wheelbase is 115 in.

The larger six has an overhead valve, 3⅜ by 5 in., unit power plant with a 2½-in. crankshaft, dry disk clutch, and Hotchkiss drive. The chassis is 125 in. wheelbase.

Kissel

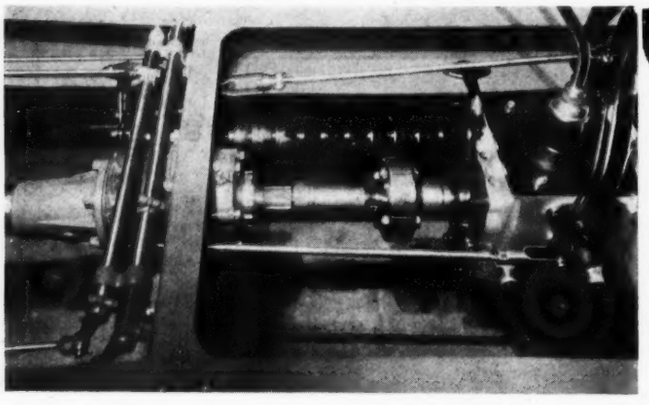
The new Kissel six-cylinder model is shown for the first time at the show. This model is furnished in four body styles. The cylinders on the new power plant are block cast and the bore and stroke are 3 5/16 in. and 5⅛ in. respectively. The cylinder head is detachable. Cooling water is circulated by centrifugal pump and the rate of flow is controlled by thermostat. Lubrication is by a gear-type pump which furnishes oil under pressure to the main bearings. Stromberg carbureter, Remy starting, lighting and ignition, Stewart vacuum system and Willard battery are regular equipment. The clutch is a multiple dry disk and the gearset provides three speeds forward. The axles are Timken, the rear being a full floating type with a reduction of 4.4 to 1. The springs are semi-elliptic underslung at the rear. Both brakes are on drums on the rear wheels, the service brake being of the contracting type and the emergency of the expanding type.

Stearns-Knight

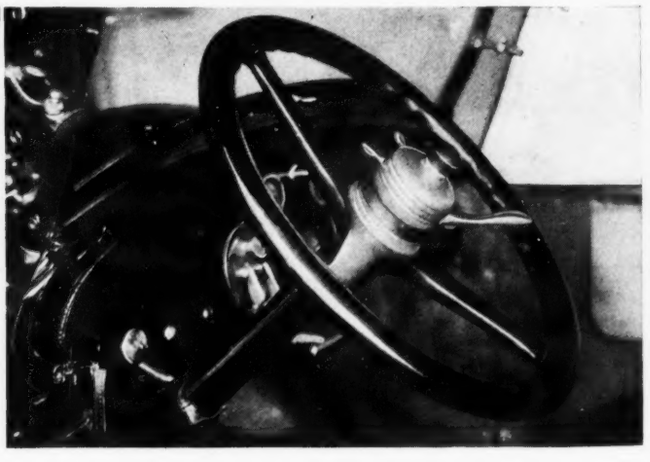
The Stearns-Knight Six which was announced some months back is making its first appearance at a national show. The only mechanical change of note is that Zenith and Stromberg carbureters are now regular equipment. Two new body jobs are displayed, a convertible coupe and a sport sedan.

The convertible coupe is painted a light blue with black and gold trimmings. There are two panels of trapezoidal shape on the top of the hood. These panels are formed by a narrow molding which is emphasized by the black and gold trimming. The upholstery is brown leather and the top is collapsible. The rear deck is unusually high and contains a capacious rumble seat for two passengers. Body guard bars cover a portion of the top of the rear deck.

The sport sedan has the appearance of a sedan landaulet. The body is gray and the top is black.



Above—Compensating counter shaft between gearset and propeller shaft on H. C. S. six.



Right—Apperson has eliminated levers from the front compartment and concentrated the control on the steering column

Engineering Practice Leaves Much to Be Accomplished

Constructive suggestions based on critical survey of New York show. Much can still be done toward making engine and chassis parts more accessible, improving brakes, steering gears and various control connections.

By Henry M. Crane and Herbert Chase*

LOW first cost rather than lowest cost per mile of transportation, life, repairs and other factors considered—seems still to be the guiding rule of many American passenger car manufacturers as judged by the cars seen at the New York show. This policy has been largely dictated by the buying public and has made possible the present extraordinary production and use of motor vehicles.

Even now the lowest priced American cars are excellent values for the money, but as chassis and body design becomes more stabilized it is believed that the public will appreciate greater durability and lower cost of upkeep. The time has come for efforts to secure greater durability and better service and several makers are giving these factors greater consideration than ever before.

The design of some present day cars is not beyond criticism. There are, in fact, numerous examples of faulty engineering which do not result in any decrease in the cost of the product. Fundamental principles which should govern the design of parts and which have been frequently discussed in engineering publications are often overlooked. There are, however, many indications that some of the fundamentals and advanced engineering practices brought out in these publications and in recent discussions before the Society of Automotive Engineers are being applied to advantage.

High Speed Engine Practice

There appear to be increased tendencies in certain directions to raise the maximum power of engines of a given displacement by so designing them as to bring the peak of the power curve at a higher crankshaft speed. It is believed that in some cases the cost and weight of the resultant product have been materially increased while good performance at lower crankshaft speeds has been sacrificed. It is our view that in cases where increased power is required it could have been obtained to better advantage by building an engine of somewhat large displacement designed to run at slower speed. As a matter of fact these high powers obtained at very high speed can only be realized on the road at car speeds beyond the reach or desire of the average car owner.

To successfully produce high speed engines which are comparatively free from vibration involves a number of refinements which are not necessary in lower speed types. It also involves the use of lower axle gear ratios, and certain sacrifices in economy of fuel which are not to be commended. There is reason to doubt whether the saving in weight claimed for the higher speed types is worth while even if it is actually attained in practice, and it is also questionable whether the high speed engine is as durable as the lower speed type of equal power output. Too much stress is sometimes laid upon attaining certain extreme performance which is seldom required in average use.

Less Expensive Closed Bodies

There is much to be commended in the strenuous efforts being put forth by body designers and manufacturers to produce satisfactory closed bodies at a lower price. This certainly helps toward making the car more of an all-year vehicle and thereby greatly increasing its utility. The tendency toward the wider use of closed bodies has had at least two important reactions upon chassis design which are manifest in a number of cars at the show. One of these is the use of stiffer frame construction which enables the closed body to be employed successfully even under adverse road conditions, and the second is the emphasis which has been placed upon the production of smoother running engines.

The drumming tendency which is characteristic of nearly all closed body types has served to amplify the noise which originates in the vibrations of the engine and has made it necessary to minimize this source of noise by care in balancing the engine and otherwise improving its smoothness of operation. Here, again, the use of high-speed engines has not tended to simplify the problem. Probably with this, among other factors in mind, some companies who have hitherto made four-cylinder cars exclusively have now added six-cylinder chassis to their line. Examples in this connection are the Mercer, Dort, Stutz and H.C.S. There are a few new four-cylinder engines in the lower price class, but all other new engines are sixes—a rather significant fact from two or three different standpoints.

There are no new eights being marketed, and although it is recognized that some cars with eight-cylinder engines have made enviable records, the lack of accessibility and the greater number of parts which are involved in the usual design of the V-type eight leads one to the belief that this class of engine will probably be confined eventually to higher priced, higher power cars,

*This article was prepared as a result of a visit to the New York show prior to its formal opening when some exhibits were not in place and others were not ready for inspection. It is not intended as a review of the show in its entirety.

especially in view of the excellent performance with which many sixes are justly credited.

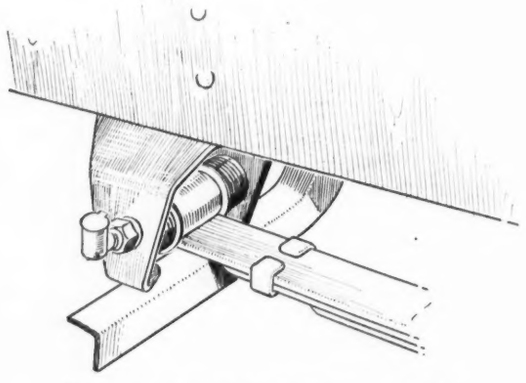
Even in the lower priced classes there are several new sixes some of which supplement or supersede four-cylinder models.

Among the commendable improvements in engine construction observed are the stiffer crankshafts used in several engines. A number have not only stiffened the arms of the shaft, but have increased the bearing diameters and in some cases the number of main bearings. There are more cars which employ pressure feed to all crankshaft bearings—an excellent system when the details are well carried out. When the fit of the bearing is depended upon to limit the flow of oil, however, there is apt to be excessive lubrication after the bearings become worn. Some instances were noted in which unsupported oil pipes of considerable length were fitted between main bearings of the crankshaft. With this type of construction vibration is apt to result in fracture of the pipe adjacent to some fitting and thus cause lubrication to fail at a critical point without the knowledge of the operator. Such a construction is certainly to be avoided.

Chandler Engine Changes

Considerable changes are noticeable in the Chandler engine. Cylinders previously cast in pairs are now in block and have a single detachable head. The combustion chamber employed is of the type in which most of the clearance volume is above the valves, giving much the same compact form of combustion chamber usually associated with overhead valve construction and coupled with a high degree of turbulence which, in effect, decreases the size of the chamber. This is said to produce a smoother running engine and freedom from detonation.

Among the other new chassis at the show was the new Chevrolet copper-cooled job, which was described in these columns two weeks ago. This chassis presents a number of interesting elements and, on the whole, seems to have

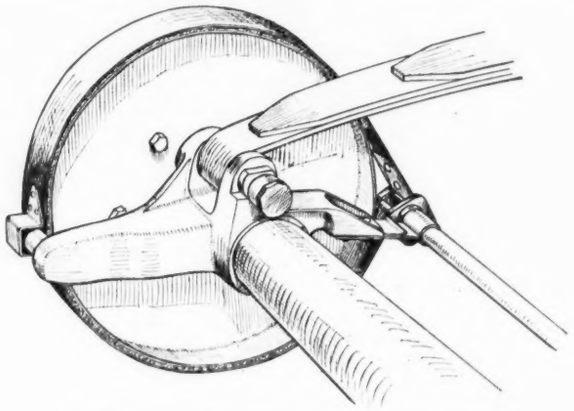


Front bracket of Chandler rear spring

been well worked out. One point of interest is the arrangement of the wheel brakes, which are of a simple contracting band type, anchored at the center of the band. The brake shaft is supported at the brake by a flexible member which permits limited motion of the shaft end and should help toward securing a uniform bearing of the two halves of the brake band. The construction is similar to that used by Franklin except that the anchorage is not at the cam.

It will be interesting to observe what effect normal service operations will have upon the new Chevrolet engine. It is not to be denied that air cooling in this as in other cases does not make for accessibility in certain particulars. It is necessary, of course, to remove the cylinders in order to grind the valves. The cooling of pistons and valve seats in this design is excellent; that of the valve stems and guides is not so good. Just what effect in wear of valve stems and guides there will be with the construction employed is a question which naturally arises.

There is evidence at the show of an increase in the number of engines using aluminum pistons. This type of piston has certain advantages in respect to its higher heat conductivity and lighter weight, but there is reason



Chevrolet "copper cooled" brake construction

to doubt whether cylinders used with aluminum pistons will have as long a life as those in which well designed cast iron pistons are employed.

A number of small items in connection with the powerplant which might well be given consideration were observed. One of these has to do with water connections which frequently have an unnecessary number of bends, especially sharp bends which impose considerable resistance to water flow and are particularly objectionable in the case of thermo-syphon circulation. Hot air stoves are used in many cases and the piping between them and the carbureter is often poorly arranged. Although there are advantages in heating the carbureter, especially if its temperature is kept reasonably constant, preheating the whole body of the air is probably the least satisfactory method of conveying heat to the fuel. If heat is necessary to aid distribution it is better to heat the manifold walls than to depend upon preheating the air.

Fuel Vaporization

The writers are among those who believe, however, that most of the heating necessary for vaporization of the fuel can best be added after the charge enters the cylinders. In fact, it is doubtful whether it is feasible to provide sufficient heat from the surfaces which the charge encounters on its way to the cylinder in the limited time available for such heating. In the cylinder both the time and area necessary for heating are available and can be used to advantage in heating the charge since the piston and other hot parts exposed to the heat of the combustion are thereby cooled.

Lack of care is to be noted in the layout of control rods and linkage, operating throttle and spark timer. Often the rods and other parts employed for this purpose are so indirect in their action and so flimsy as to render accurate control of the spark and throttle position impossible.

In a number of cases it appeared that no consideration had been given to providing an adequate outlet for the air which must pass through the radiator in order to effect satisfactory cooling. Often sheet metal plates are placed between engine and frame in such a way that no adequate air opening is left. Such plates not only prevent proper

air circulation but often are so constructed as to produce drumming and thus amplify noise which would otherwise be less noticeable.

In some cases excessively large inlet pipes are still used, and in others no care is taken to so arrange the exhaust piping and ports that interference will not result.

On the light Studebaker particular care has evidently been used to make the electric wiring accessible although this wiring is carefully inclosed in metal armor. Failure to give attention to details of this character often results in much loss of time in tracing electrical troubles.

One of the evidences of careless manufacture or assembly, or both, was the excessive amount of play found in a number of steering systems. Some steering gears are designed in such a way that backlash can be eliminated by careful adjustment but in these cases the bearing surfaces are not always well proportioned with the result that excessive play soon develops in service. A fault to be found in the design of the steering system on several cars has to do with the arrangement of the king pin in a position considerably removed from the wheel hub. The axis of the pin could, in many cases, be brought as much as an inch nearer the hub and still allow ample clearance at the same time minimizing steering system stresses and making the steering easier.

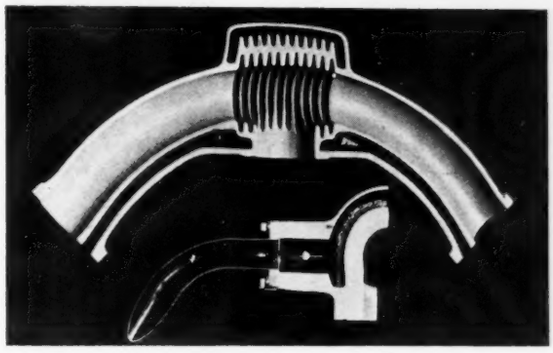
Changes in Tie Rod Practice

More cars appear to be abandoning the yoke type of tie-rod in favor of the ball and socket type which has several advantages. A neat inclosure of the ball sockets both in the drive link and tie-rods, was noted on several cars. This consists of a metal cover which fits over the opening which would otherwise be left for entrance of dust and moisture. In some cases this cover is held in place with a spring and a felt washer is used to help make a tighter joint.

On the whole there is a decided lack of improvement in steering gears and brakes, the two most important elements of the car from the standpoint of safety. Certainly these parts should receive attention in proportion to their importance for there are no features of design which place so heavy a responsibility upon engineering and manufacturing departments as do those concerned with the safety of all users of the highways.

Data are not at hand on the basis of which to determine whether or not fabric type universal joints are increasing, although these were noted on some new chassis. They appear to have the decided advantage of requiring no lubrication and of affording a certain cushioning effect. If their durability in service can be assured they will doubtless increase in popularity.

The use of steel in place of wood for felloes was noted



LaFayette manifold construction

on a number of cars produced in large quantities. This type of construction is undoubtedly gaining in popularity and possesses certain evident advantages over the all wood construction, if, as is claimed, it provides a lighter wheel without sacrificing the convenience of the demountable rim.

Among the details in body construction noted is the use of heavy chain door stops which appear to be substantial but leads to the question whether it is not better to use a type of stop so arranged that in case the door is caught accidentally when the car is in motion it will be torn loose without serious injury to the door itself or the door pillars.

A poor practice in construction of front seat backs is that of tilting them to the rear in such a way that the driver finds it difficult to sit in an upright position with comfort. Some car users prefer this arrangement but when leaning backward the driver is not in a good position to operate the controls to best advantage, especially in the case of an emergency where a quick stop or sudden change in direction is necessary. Some instances of the use of wide corner pillars on closed bodies which make bad blind spots for the driver were noted. These add to the danger of driving and are certainly not to be commended.

Body Space Too Short

In a number of instances the space on the chassis back of the engine allowed for the body affords too little opportunity for fitting a commodious and good appearing body. In some cases room is wasted at the front end of the chassis, especially between the engine and the radiator which, had the layout been better, could have been used in such a way as to leave additional space further back where it is needed. A number of concerns have lengthened the chassis or the body space in order to better accommodate the larger closed bodies.

Motor Show Exhibitors Fill Madison Square Garden

DURING the week of the automobile show at the Grand Central Palace there is being given a Motor Show at the Madison Square Garden. Here some nine different makes of cars are on display.

Ford and Lincoln are being exhibited by a local representative, the Downtown Sales Co. A full line of Ford cars are being shown as well as chassis mounted with a suburban body and a covered delivery body. A Fordson tractor completes the display. The Lincoln exhibit comprises a standard seven-passenger phaeton and a sedan.

Taxicabs are being displayed by Driggs, R & L and Checker Cab, while the Stratton-Bliss Co., local Dodge representatives, are showing a Dodge chassis mounting a taxicab body. Driggs and Checker Cab are also exhibiting chassis, and the latter shows a taxicab body in the wood frame stage as does R & L as well.

Victor Page is exhibiting a closed body and two open ones, mounted on his four-cylinder air-cooled chassis and a Coats Steamer chassis completes the car manufacturers' exhibits. The English Sunbeam is being shown by the local representative. This exhibit comprises a phaeton and a coupe.

The rest of the Garden is given over to exhibits of parts and accessories of which there are a goodly number. These run all the way from Ford accessories to convertible bodies and surplus government trailers.

Durability and Silence Stressed in Chassis Design

Single plate clutch gains in popularity. Efforts made to better brakes. Tendency away from unit power plants. Anti-rattle features appear on springs. Accessibility improved.

By P. M. Heldt

A SURVEY of the chassis at the Show reveals many interesting changes in design, in things that are apparent to the view as well as in the case of such items as clutches and gearsets, of which comparatively little can be seen from the outside.

Engineering effort has been directed toward making cars more accessible for servicing and more silent in operation, and designers have been particularly at pains to increase durability, so their cars would maintain good performance in the hands of users. To this end modifications in chassis design have been made, and while not radical in nature they are of great value and significant of this year's engineering endeavors.

In the line of clutches there has been a great deal of activity the past year. Practically all of the development work has been done on dry disk or plate clutches, chiefly the single plate type. This type of clutch, as generally designed, not only has a very small moment of inertia, and as a result is comparatively easy on the teeth of the gearset in clashing, but it also offers advantages from the viewpoint of low cost of production.

In one of the new single plate clutches brought out in the course of the year, which is the design of Charles B. Rose and is being manufactured by Baker Brothers, an endeavor is made to insure uniform distribution of the pressure over the whole frictional surface. It will be easily seen that the wearing qualities of the friction disks will be improved if uniform distribution of the pressure is assured, as it is the maximum pressure at any point that determines the wear or injury to the clutch lining in slipping.

Action of Rose Clutch

In the Rose clutch the pressure plate is provided with a spherical surface, and against this plate rests another with a similar surface, through which the pressure of the springs is transmitted to the pressure plate. The action is quite similar to that in a certain type of ball thrust-bearing. Another feature of the Rose clutch is disengaging springs which pull the three friction members apart when the clutch is disengaged.

One of the most difficult parts of a chassis to lubricate satisfactorily is the clutch throw-out sleeve, as it is hard to get at, and any lubricant which it is desired to feed to it is often thrown off by centrifugal force. To overcome this difficulty Rose has eliminated this bearing, making the sleeve of such bore that it does not bear on the shaft at all.

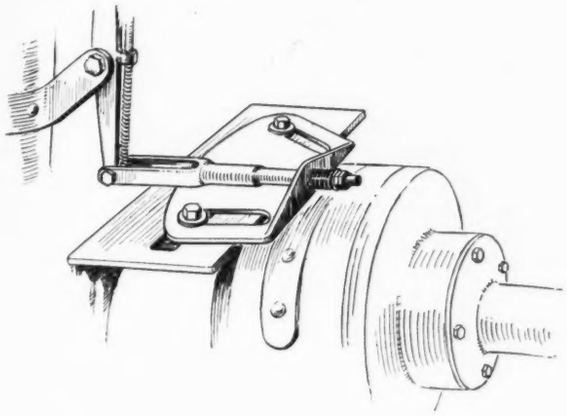
The same type of clutch is used on the various cars manufactured by the Durant Motors Corp. The driven member is a single plate clamped between the flywheel web and the pressure ring. In one type of the Durant clutch floating asbestos rings are used, but in another, later type, there are sectors of Raybestos riveted to the steel disk. The sectors on opposite sides of the disk are staggered, and the disk itself is slightly offset at the radial edges of the sectors, which gives a certain amount of elasticity and prevents grabbing. In the Durant clutch the springs bear directly against the pressure ring and their pressure is not multiplied by levers. The clutch pedal pressure applied to withdraw the clutch is thus multiplied, however, and, consequently, the clutch is not hard to operate.

Clutches Easier to Withdraw

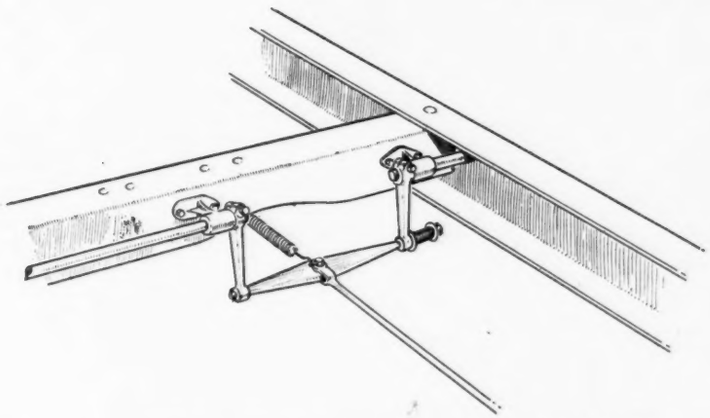
An easy operating clutch is very desirable, as it greatly lessens the strain on the driver, especially in congested traffic, where the clutch must be withdrawn at frequent intervals. Realizing this condition, several manufacturers have changed their designs this year to make their clutch easier to withdraw. Thus, for instance, the Chandler Motor Car Co. has lengthened the clutch pedal and reduced the clutch spring pressure, while the Maxwell Motor Co. introduced a compound reducing motion between the clutch pedal and the throw-out collar.

The single plate clutch seems to have gained in popularity a good deal, especially for use in light cars, and as these cars have the greatest production, most of the clutch manufacturers now are making a design of single plate clutch. Thus the Detroit Gear and Clutch Co. during the year brought out a clutch which is similar to the Durant in that the springs, of which a whole dozen are used (which, of course, tends toward even distribution of the pressure over the whole circumference), bear directly against the pressure ring, while the pedal pressure is multiplied by levers within the clutch. Three levers are employed in this clutch, as against four in the Durant, and they produce a sort of toggle effect. Merchant & Evans, another firm of clutch manufacturers, has also brought out a single plate type of clutch, which was described and illustrated in AUTOMOTIVE INDUSTRIES only a short time ago.

But while the single plate clutch is quite satisfactory



Chevrolet "copper cooled" transmission brake

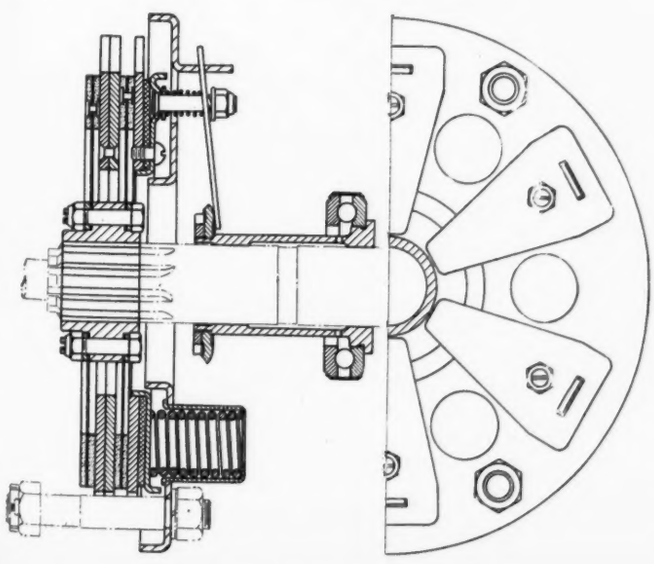


Anti-rattlers on Chandler brake equalizing gear

and has the vogue for light cars, it is not so well adapted to more heavily powered vehicles, owing to the fact that the surface area obtainable is quite limited, and now and then one hears of cases where that type has proved unsatisfactory for the simple reason that the clutch used was inadequate for the work. This year two makers who formerly used the single plate clutch have adopted the multiple disk type. In the new Case car eight disks are used and in the Nash Six, seven disks.

A sectional view is shown herewith of the Long clutch which has been used on the Jewett during the past year and has now been adopted also for the Paige 6-70. It is of the dry plate type, the drive from the flywheel to the pressed steel member containing the springs being by three driving pins. There are six coil springs, evenly spaced around the circumference, and each exerts a pressure of 100 lb. Between the two driven disks which are faced on both sides with asbestos fabric, is a driving disk. The driven disks are bolted to the clutch hub, which latter is mounted on a ten spline fitting on the clutch shaft.

The clutch release operates on a series of six circumferentially spaced plate levers fulcrumed at their outer ends and held in place by coil tension springs. It is claimed that, since the springs bear directly against the clutch plates near their circumference, instead of being located at the center and having their pressure transmitted through levers, the tendency toward unequal distribution of the pressure over the plate surface is eliminated. Most of the spinning weight is concentrated at the hub and the moment of inertia is low, which facilitates gear changing. In the Paige car advantage has been taken of this fact to reduce the throw in the gearset to obtain a quicker shift.



Two views of Long dry plate clutch

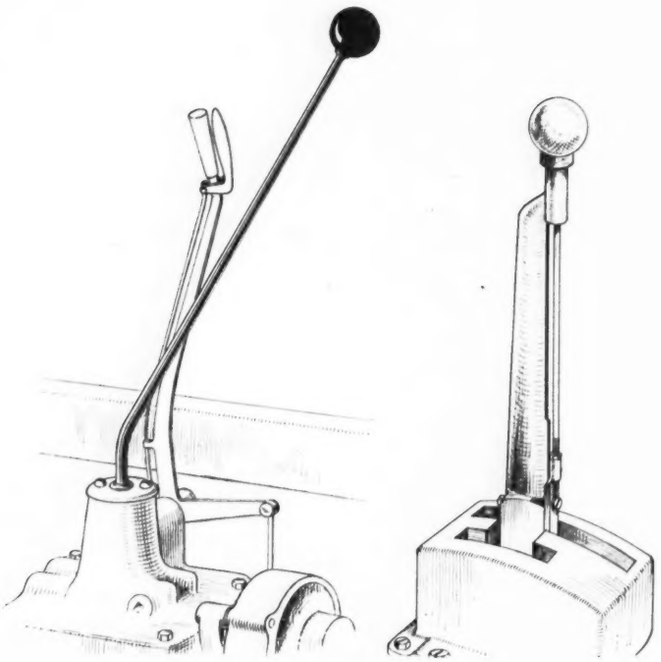
Perhaps the most notable development in clutches the past year was made by the Locomobile Co., in whose new clutch the driving members are made of molded Raybestos and metallic driving disks are dispensed with. To reduce the pressure on the driving teeth of the Raybestos the disks are made somewhat larger in diameter than formerly and involute shaped driving teeth or keys are used.

Unit Power Plant Loses Ground

Not much new in the line of gearsets was observed, but an accessory of the gearbox, the transmission lock, is "coming strong," to use a colloquialism. It has been adopted this year by Buick, Kissel and Rickenbacker, among others. There is a noticeable tendency away from the unit powerplant. This move, it appears, was started by Studebaker some years ago and is now participated in by Durant in various models and by Stutz in the new Six. In the Locomobile the teeth of most of the gears in the gearset are now ground, to insure silent operation on all speeds. Several changes have been made in the Maxwell gearset, which now has wider gear faces and drives the speedometer. While there is nothing out of the ordinary in any of the new gearsets as far as the arrangement of their parts is concerned, their remarkably small size as compared with gearsets of only a few years ago is very striking.

Passenger car axles have been very much standardized and new designs are a rarity. In the new H. C. S. six there is a short shaft behind the gearset which connects through a universal joint to the propeller shaft. This universal joint is enclosed in a spherical joint supported on a frame cross member. Fox has given up the Hotchkiss drive and now uses a torque arm, Mercer uses a three-quarter floating axle instead of a full floating, and Maxwell a semi-floating instead of a three-quarter floating. On the Franklin axle, which is of the built-up type, the spring saddle, brake shaft hanger and brake carrier are three separate drop forgings. Usually these parts are made of malleable castings. Maxwell has given up the built-up axle and gone over to the pressed steel housing type, which is not much used in the lower-priced class of car so far.

Very earnest endeavors seem to have been made to improve the brakes, both as regards their power and durability and their details of design. In the new Chandler anti-rattlers are used on the equalizing gear. The equalizing lever is extended at one end beyond the brake arm and carries a strong coiled spring which forces the lever and the arms into firm contact and thereby prevents rattling even after the joints have worn perceptibly.



A contrast in gearshift levers

The transmission brake seems to be making some slight headway, especially on the lower priced cars, though it has been given up by at least one manufacturer (Fox). The Chevrolet copper cooled car is one of the new models with a transmission brake and the brake operating mechanism, shown by the accompanying sketch, is particularly simple. As both ends of the band are positively released it should also be a very practical design. As will be seen from the sketch, on top of the brake drum there is located a cam plate with cam slots. Studs secured to the ends of the brake band pass through these diverging slots, and also through slots in another plate which are parallel to the plane of the brake drum. By pulling on the plate with the diverging slots, the ends of the brake band are pulled together, while, if the plate is released, a coiled spring, secured to it on the opposite side as the pull rod, returns it to the "off" position.

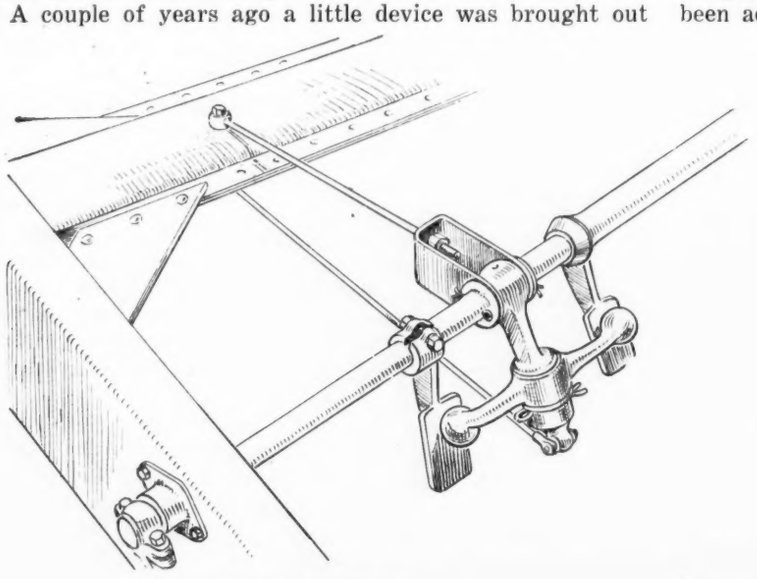
Many makers have increased the size of their brakes. In the Nash six they have been increased from 12 to 18 in. in diameter and the service brakes on the Franklin have also been made larger.

A couple of years ago a little device was brought out by a specialty manufacturer which permits of taking up on the brake rods without taking the yoked connector off. Of course, any slack in rods can be taken up if there is a turnbuckle incorporated in them, but turnbuckles are not very extensively used for the purpose, being evidently considered too expensive by manufacturers of the cheaper grades of car, and before the appearance of the device referred to the usual method of adjusting brake rods consisted in removing the pin from a joint in the brake linkage, screwing the yoke farther onto the rod and then replacing the pin and locking it.

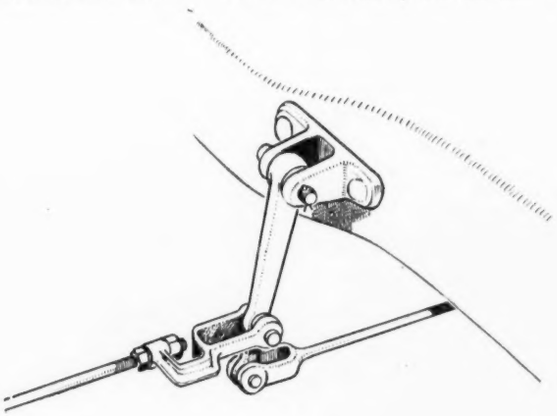
The connector which obviates taking the linkage apart seems to have met with considerable favor and is now seen on a number of cars of large production. A somewhat similar connector which also obviates the necessity of taking the joint apart has now been adopted by several other manufacturers. As shown by the sketch herewith, it consists of a sort of double yoke, the two being at right angles to each other. One of the yokes serves the regular purpose and through a hole in the outer prong of the other is passed the brake rod, carrying nuts on both sides.

On the Mercer six the transmission brake is carried on a special ball bearing on the frame instead of on the rear bearing of the gearset, and there is a fabric type universal joint between the gearset and the brake. Franklin has substituted a cable for the rod connection to the rear wheel brakes and has placed the hand brake lever on the outside of the wood sill. Rickenbacker has adopted the differential type of brake equalizer and Nash uses the special design shown by the sketch herewith. On the new Peerless all of the bearings on the brake operating shafts are of the oilless type, thus making it unnecessary to get under the car for purposes of lubrication.

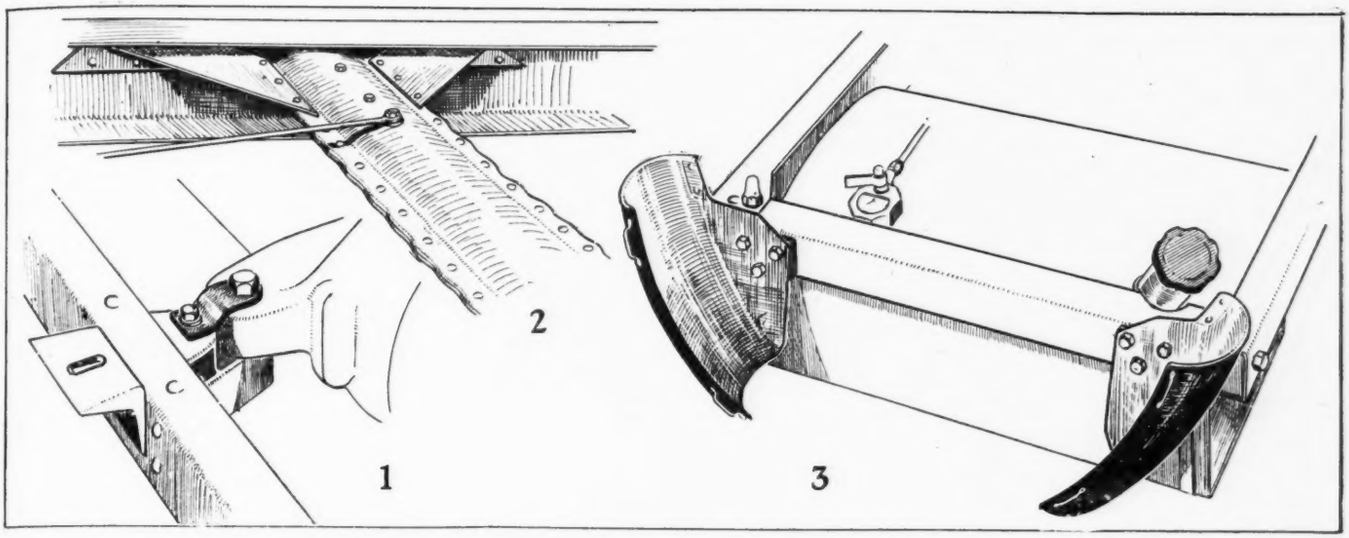
Frames have been strengthened or stiffened in a great many instances. One reason for this is undoubtedly the increasing call for closed bodies, which impose greater loads on the frame and also suffer more than the open type from insufficient frame rigidity. One of the changes in the Case is the adoption of a heavier cross member in front. Attention may be called to the type of engine rear supporting bracket used on that car, which is shown in the sketch. This should not only make a very substantial support but permit of easy removal of the engine. On the new Chandler there is a peculiar form of pressed steel central cross member which is perhaps best described as two Z bars joined together. On the Willys-Knight a tubular cross member with flanged fittings has been added at the front. On the Mitchell, which has its



Nash brake equalizer



Easily adjustable yoke for brake rod found on the Dort



1—Rear engine bracket on Case. 2—Central frame cross member on Nash six. 3—New tire carrier on Franklin

transmission at the forward end of the torque tube, the transmission hanger has been strengthened.

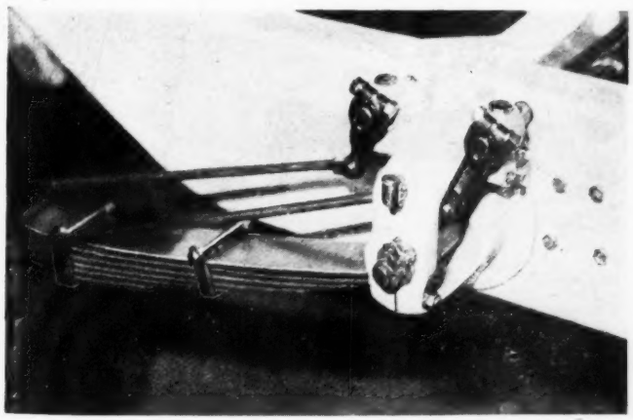
On the Franklin the wood sills of the frame have been extended at the rear and a pressed steel armoring and cross member for the combined tank support and spare tire carrier added. The tire carrier is of a new type and is shown by the accompanying sketch. Reports of increases in frame sections or in weight of stock were frequent. The Nash six has the frame strengthened by the addition of a tubular cross member at the front and of a pressed steel cross member of peculiar form (see sketch) at about the forward end of the rear springs. On the Rickenbacker an 8-in. frame with seven cross members is used and on the Stutz six a 7-in. frame with ten cross members. On the R. & V. Knight braces extend from the cross members to the bottom of the forward spring bracket.

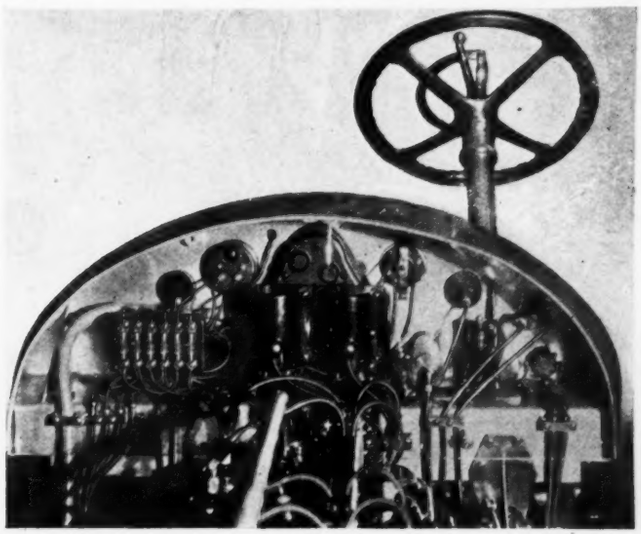
Securing Rigidity of Frame

Evidently, to get a rigid frame, highly resistant to torsional or weaving influences, it is necessary to use side members of considerable depth and place the cross members at different levels. In one frame (Dorris) the central cross member is made very deep and has a large opening in the center for the propeller shaft to pass through. A pair of cross members of slightly arched form with another in between passing underneath the propeller shaft give about the same effect. Tubular cross members are known to add greatly to the stiffness of the frame and are being used in increasing numbers. In the Durant the muffler is made use of as a frame member and extends longitudinally as usual.

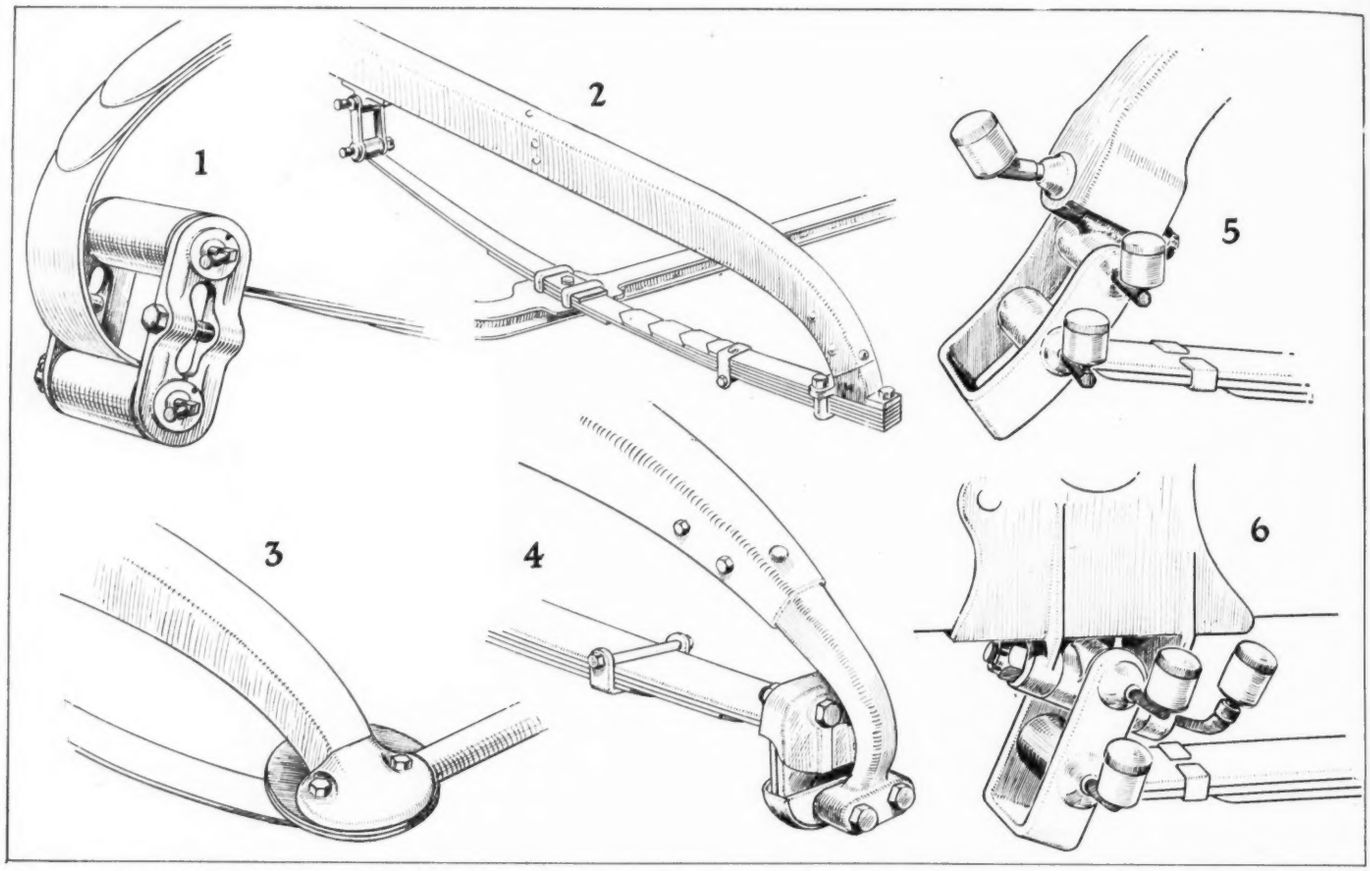
Springs have been improved in a good many cars, but more as regards anti-rattle features than their springing or cushioning qualities. A short time ago we described the Gibson wedge, which is inserted between the spring bracket and spring eye and automatically takes up any play that develops at this point. This is shown on the R. & V. Knight chassis. A method of adjustment invented by A. C. Schulz was described at the same time. On the Dort the spring brackets are so designed that they can be forced together by means of the spring bolt and nut if the spring eye develops side play. On the new Chandler a heavy coiled spring is placed at the side of the shackle and firmly holds the shackle against the spring eye, thus preventing all rattle.

On the new Stratton-Premier, one of the new low-priced cars, the springing arrangement is about the most interesting feature. Quarter elliptic springs are used, the heavy end being held to the spring bracket on the frame by the so-called center bolt and a clip whose ends pass through holes in lugs on the spring bracket. The small end is fastened to the axle, but the main leaf is continued beyond the axle and at the opposite end connects to the





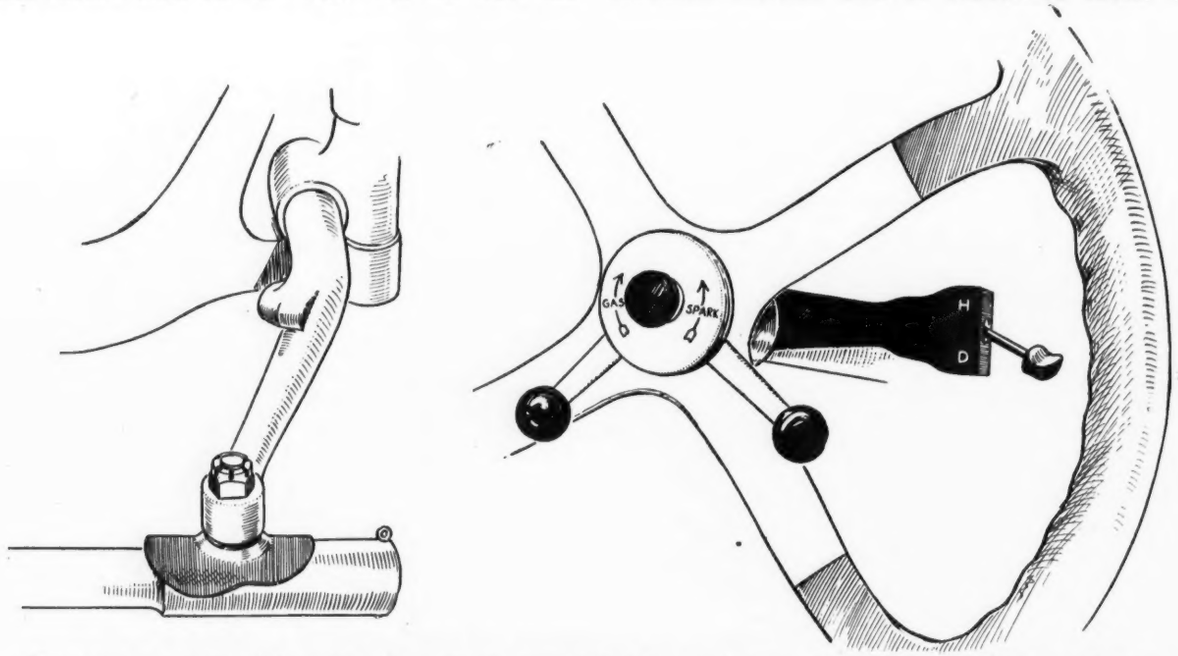
(Above) Forward bracket of Dorris rear spring.
(Right) View under the Locomobile cowl



1—Locomobile split spring shackle. 2—Rear spring on Premier four. 3 and 4—Fabric type spring shackles on Handley. 5 and 6—Universal shackle connection at rear end of springs on R. & V. Knight

frame through the intermediary of a pair of shackles (see sketch). However, this end of the main leaf is under no load and serves merely as an extra connection between the axle and the frame.

Buick and Hupmobile lengthened their springs, the former 2 in. and the latter 1½ in. Hupmobile at the same time added two leaves. Lafayette now uses electric chromium silico-manganese steel for the main and reverse leaves and carbon steel for the rest. On the Dort the spring eyes are now bushed with phosphor bronze instead of with soft steel. Fabric type shackles are used at both ends of the springs on the Handley. The shackle at the rear ends is of a type which has been illustrated in AUTOMOTIVE INDUSTRIES, but at the front end of both the front and the rear springs is used a shackle which is capable of taking the driving thrust as well as the vertical load. Referring to the sketch of the device, there is a horizontal circular disk of rubberized fabric which is



Metal covered ball joint in tie rod on H. C. S. and lighting switch on bracket under steering wheel on Mercer

bolted to the spring at the front and rear and to the bracket at the two sides. On the R. & V. Knight the front and rear springs have universal connections to the frame at their rear ends, as shown by the sketch herewith. This feature is not new with the firm, but is unusual. Its object is to reduce the stresses on the frame.

Many minor improvements have also been made in the steering gear. In the first place, an investigation revealed that a good many manufacturers are now using the ball and socket type of joint for the tie rod, where only a couple of years ago the yoke type of joint was practically universal. One consideration which may have led to this change is that when the two king pins are not absolutely parallel, the joint cannot move freely, if of the yoked or forked type and closely fitted, but the chief advantage of the ball joint over the forked type is undoubtedly that it can be made self-adjusting for wear.

Several steering posts were noticed that could be adjusted as to angle of rake. Among these were those on the Mitchell and Kissel. On the Mitchell the steering gear housing is held in a trunnion and the post, where it passes through the dashboard, is provided with a collar from which extends an eyebolt which passes through a hole or a slot in a bracket on the forward side of the dash. Nuts on the eyebolt on both sides of the bracket permit of easy adjustment.

It seems that many of the steering gears made by specialists are designed to have a trunnion support at the bottom and can therefore be made adjustable without great difficulty, but this is done only to make it possible to meet the requirements of different car manufacturers as to rake and not for the purpose of making the post adjustable on the individual car.

On the Chandler a taper roller bearing is used at the upper end of the knuckle spindle and on the Dort phosphor bronze bushings are now used in the steering linkage yoke. The pin is fixed in the steering arm and has its bearings in the yoke. The Gray has a steering wheel spider of pressed steel and the spark and throttle levers are mounted on the steering post underneath the wheel, moving on notched sectors of cast aluminum. The Locomobile has a bronze steering wheel spider, while those on the H. C. S. and Studebaker are of all-wood construction. The Studebaker has adopted short spark and throttle levers. On the Mercer six the lighting switch is mounted on the steering post just below the wheel, as shown in the sketch herewith. This makes the switch accessible to the driver while occupying a comfortable position in his seat. On the Maxwell, bushings of soft rubber are inserted between the steering tube and the shaft within it, at both top and bottom, to prevent rattles.

As regards wheels, there are several makes of car at the show furnishing disk wheels as regular equipment. While wire wheels are also to be seen, they are found only on high-priced cars of the class that are generally chauffeur driven.

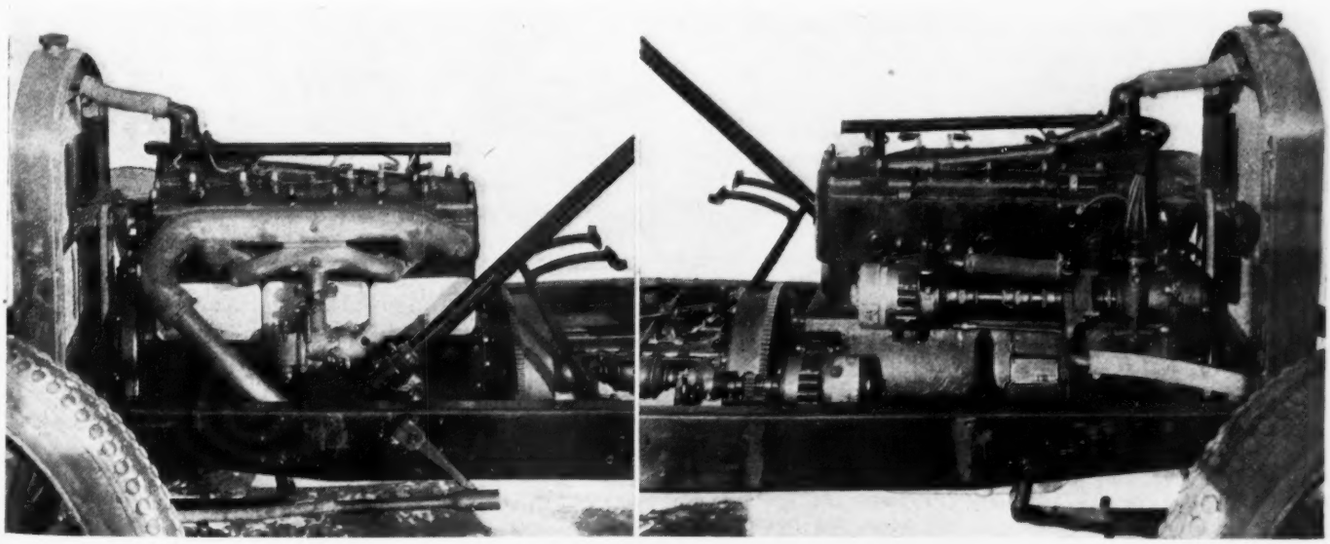
Engine Design Shows Service Influence

Excellence in engineering found on moderate priced cars. Maintenance of engine performance featured.

By A. Ludlow Clayden

NEVER before at a National Show has engine design indicated so strongly the influence of service considerations. In the motor cars exhibited at New York there are extremely few novelties in the line of detail design but it is most striking and significant that salesmen are for the first time in the writer's memory laying great stress on the reliability rather than upon the performance of the engine in their particular product.

Of course there are advances in design. The few entirely new jobs are well ahead of the average excellence in engineering and a particularly impressive thing is that these new engines are found on moderate priced cars; cars to be produced in quantities that make the service problem vitally important. Of course some of the highest priced cars have a reliability and a durability of a high order but when they do finally have to be overhauled—oh, what a job. On the contrary the more recent cars of moderate price seek reliability by the em-



Two views of the power plant of the new Flint

An excellent example of thermosyphon cooling system

ployment of an essentially simple design with special attention to the vital details; and the arrangement of engine accessories, controls and so on is such that tearing down and reassembly is made as easy as possible.

Very much more attention is being given to lubrication, to the dimensions and the materials of bearings, to the proportions and ring fitting of pistons, unquestionably results of troubles from oil dilution and from the fact that the present day small engines are driven much harder proportionally than the motors of a few years back.

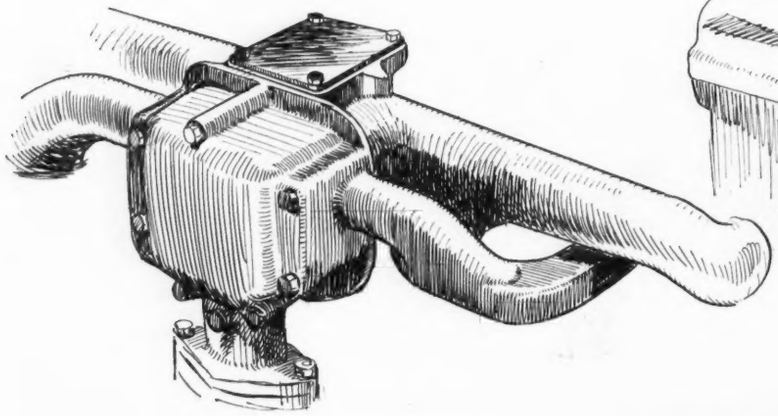
A particularly striking example of this form of detail advance is the Falls engine used on the Dort six and the Handley. The basis is a simple and inexpensive overhead valve layout differing but little at first glance from the Northway miniature six of 1918. The latter had two admitted faults, liability to become noisy if the valves were not attended to fairly often and an exceptional carbon forming tendency. The valve difficulty was due to insufficient lubrication of the rocker mechanism and because the compactness of the design made it hard to get water close enough to the exhaust valves to keep them properly cooled when running wide open. The carbon tendency was caused by the use of a high pressure oiling system which did take care of bearing wear remarkably well, but over oiled the cylinders.

To maintain the quietness of the simple rocker operated overhead valve the new Falls engine supplies oil direct to the hollow rocker shaft, through each rocker to the push rod head, down hollow push rods to the inside of hollow cylindrical tappets and through a small hole in each mushroom tappet head back to the crankcase. This lubricates every point in the valve system except the contact of valve stem and outer end of rocker. This is a small engine 3⅛ by 4¼ in. and to give adequate performance must be capable of sustained high speed. Hence a rapid flow of oil is needed calling for a high pressure, but to prevent this high pressure from flooding the cylinders a double precaution is taken. First the crankpins are drilled radially inward instead of outward, so that the centrifugal pumping effect of the shaft itself is at a minimum; second the oil release valve is double, the inner member blows off at a set pressure, while the outer member is controlled by a link from the throttle and gives practically no pressure at idling. Thus we have a carefully drilled crankshaft, drilled rockers, hollow push rods and a fairly elaborate oil release valve of which the sole purpose is to *maintain* the performance of the motor as a simpler system would work well in a new engine.

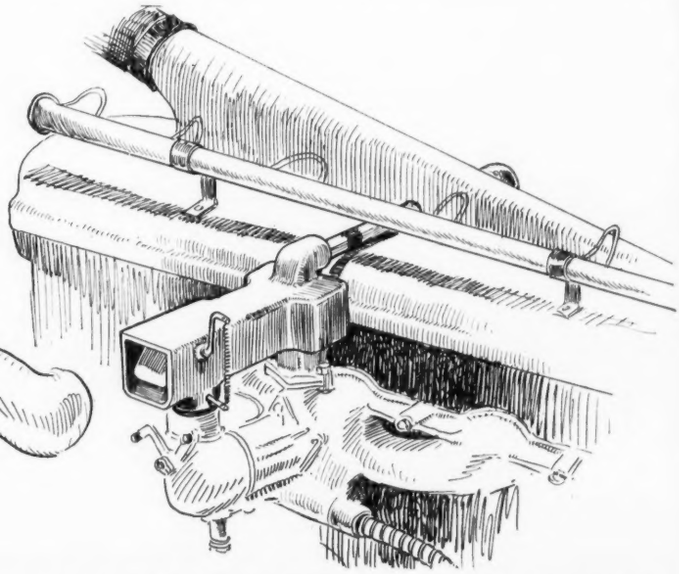
Oakland Oiling System

Oakland, starting from a similar basis has tackled the same problem in a slightly different way preferring to prevent over lubrication by the use of special pistons and piston ring equipment, the Oakland is no novelty at this present exhibition. But what is it that the Oakland salesmen are saying in describing the sectional engine? "We guarantee these crankshaft bearings for 40,000 miles, these pistons and rings for 15,000 miles." It is not the new performance but the permanence of that performance that is their point.

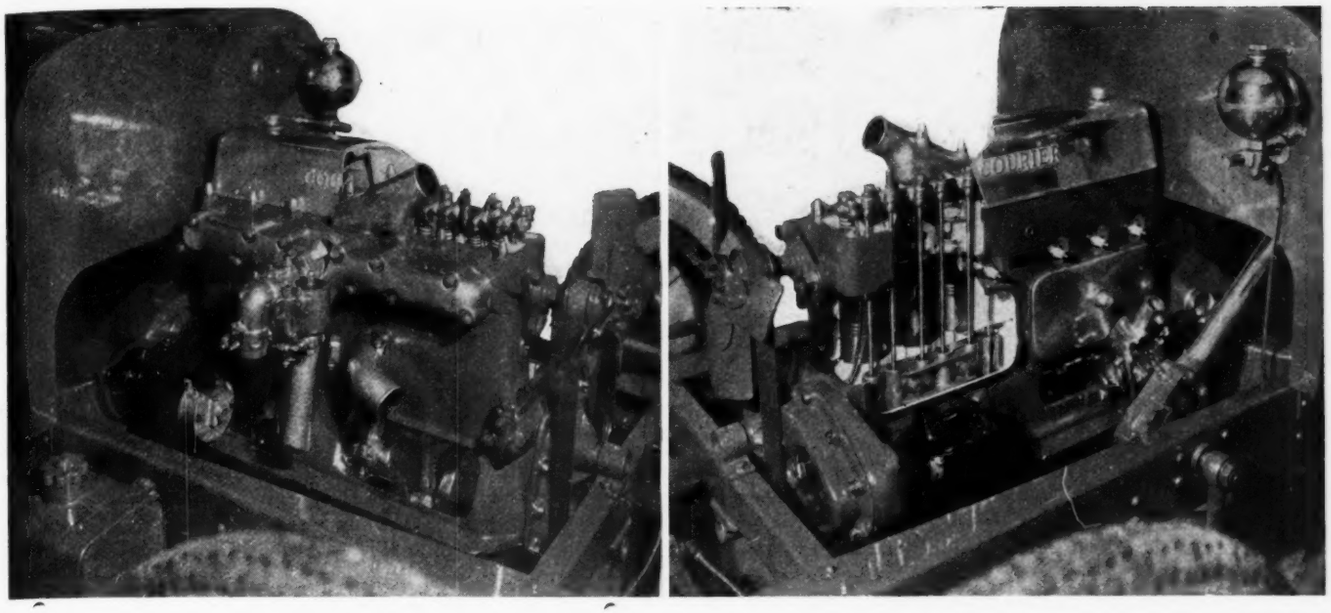
Take another case at random, the R & V Knight sixes are all shipped with a steel band right around crankcase and cylinder block, sealed so that it cannot be detached. The heads cannot be removed, or the oil pan dropped or any essential internal part even seen without breaking the seal. That it should remain unbroken is a condition of a two-year guarantee. Any R & V which needs even



Chandler manifold adjustment



R. & V. Knight system for regulating manifold temperature



Two views of new Courier engine with cylinder block cut away

carbon removal under that period will be serviced by the makers provided it is taken to one of their stations with the sealed band unbroken.

This is an entirely new sales psychology and it should be welcomed by every engineer worthy of the name for the best possible salesman is the satisfied owner who has run the same machine for several years.

Accessibility Stressed

Of course neatness of design is always improving and the service viewpoint encourages this, too, for neatness and accessibility generally go together. This is not invariably true however. For instance, there is quite a noticeable tendency back towards some external oil piping, and to oil pumps that are partially external. For example, the new Chandler where the pump is wholly outside the crankcase and easily removable, but so placed that it does not interfere with the accessibility of anything else. The things most frequently done to an engine are the removal of carbon and the grinding of valves. Both these jobs should require a minimum of disturbance of other parts than the cylinder heads and the valve springs, and on a majority of engines in the show, controls and piping are so arranged that they do not interfere with these operations.

The handling of fuel now almost invariably involves an exhaust heated surface and the variety in idea is far too great to be gone into in such a general review as this.

The Chandler, one of the few entirely new designs, has an unusual feature in that an adjustment, or rather a setting, is provided for utilization of exhaust heat. At the center of the exhaust manifold is a horizontal flange closed by a square plate. This plate has a tongue projecting into the exhaust passage. When set one way the tongue obstructs the main exhaust line and diverts the exhaust from the four rearmost cylinders around a jacket encircling the carbureter outlet. By removing four capscrews and turning the plate through a right angle, the tongue ceases to obstruct the main line and the intake jacket is then in parallel with the four rear cylinders instead of being in series. This gives a summer and winter setting which the owner can use if he has the necessary mechanical intelligence.

The R & V Knight has another new system which is quite different in principle though similar in effect. Exhaust is taken across the cylinder block to an intake jacket and thence through a long outlet pipe. This jacket is always hot, but in passing across the block the same portion of the exhaust also preheats the carbureter air which also comes across the motor through a passage parallel to and in contact with the exhaust passage. At the intake end of this air inlet is a spring controlled door which can be set either open or shut by lifting the hood and pressing a small lever, so that either hot or cold air can be admitted.

It is obvious that the work of Midgley, Ricardo and others who have contributed so much to recent knowledge of combustion, is being appreciated. This is shown in the manifolds by much better proportioning, and combustion chamber shape is also just beginning to get the attention it deserves. Another instance is the Chandler which has a flat head L cylinder with the piston almost touching at top stroke and nearly all the compression space in an arched pocket above the valves.

Front ends have had more attention than ever before. First, the proper application of the Link Belt automatic tightener and of the Morse hand operated adjustment has greatly improved chain layouts and brought their average much nearer what has long been known to be the ideal for chain constructions. Second, non-resonant gear materials have improved in quality and increased in number of sources of supply. It has been past practice almost invariably to use the dead material for the camshaft gear with steel or cast iron for the crankshaft and generator pinions. In a few modern engines this system is reversed, there being a cast iron camshaft gear with non-resonant pinions.

Chevrolet "Copper Cooled" Car

A review of this sort, however brief, would be incomplete without some mention of the Chevrolet "Copper Cooled" car which makes its initial appearance after being so long expected. This chassis is only to be regarded as an experiment in public taste. It is no longer experimental in any engineering sense, it simply remains to be seen whether its advantages offset its abnormality enough to create a lasting demand on an adequate scale. Its coming is important because it is the first low priced air cooled car sponsored by a powerful manufacturing organization.

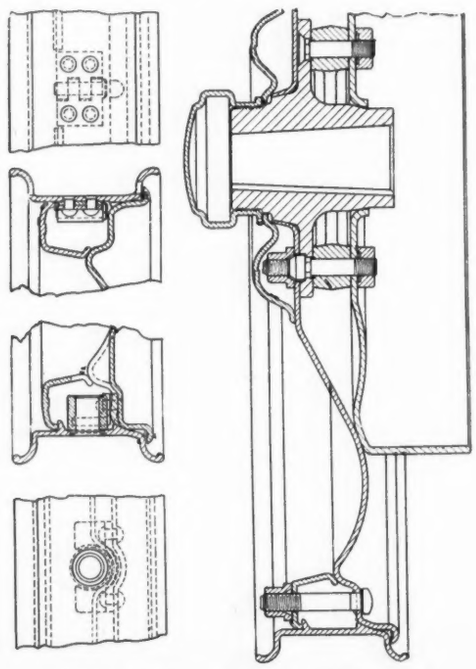
Newly Developed Parts Make Appearance at Show

Units of all descriptions cover entire automotive field.
Real improvement noted and some new features shown.

By P. M. Heldt

THE Kelsey Wheel Co. has developed a disk wheel, of which a sectional view and some details are shown herewith. The disk is of curved form, as shown; it has a taper seat on the hub, to a flange on which it is held by means of a number of studs and nuts. The studs pass through the disk, the hub flange, a spacer and the brake band (in the case of the rear wheel). The outer edge of the disk is pressed to form a seat for the tire rim, a clamping ring being used to hold the rim upon the tapered surface of the disk. The ends of the studs holding the disk to the hub, with their nuts, are concealed by a cover plate, which is held in place by the hub cap. The disk is of 3/32-in. stock, and in order to get sufficient bearing surface at the driving joints, the studs are enlarged where they pass through the disk and flange.

Some samples of this wheel have been made up of duralumin, which gives an exceedingly light wheel. The material used for these wheels is of slightly heavier gage than the steel, and, disregarding the hub, which is of steel in every case, the duralumin wheel is of only about one-half the weight of the steel wheel. The duralumin wheel naturally will have only a limited appeal, on account of its cost, but it is the belief of the Kelsey company that a wheel with the disk made of steel and the clamping ring, cover plate and hub cap of duralumin is a thoroughly practical proposition. In order to obtain a contrast in color and light appearance, there is a tendency to nickel-plate these parts, and if they are made of duralumin they cost very little more than the nickeled and polished steel parts, their finish is permanent and the saving in weight warrants the slight increase in cost. The all duralumin wheel minus the hub (that is, disk, cover plate and hub cap) weighs 15 lb. 7 oz. for the 32 x 4-in. size. The Kelsey wheel was specially designed to permit of production in duralumin, the radii being held comparatively liberal so as to obviate difficulty in the pressing process. It will be noticed from one of the details in the drawing that the valve stem can be of the standard type and is in the usual location.



Sectional view of Kelsey disk wheel

One advantage of this wheel design is that it is possible to obtain unusual color effects, for which there is a strong demand at present, especially in connection with the so-called sport models.

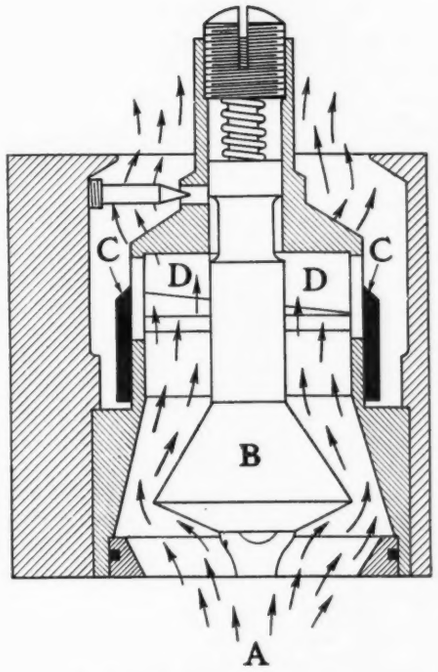
Morse Silent Chain Gearset

A silent chain gearset for motor buses is being exhibited at the Commodore by the Morse Chain Co. Silent chain speed gears have long been used by the London General Omnibus Co., and the make of transmission exhibited has been adopted by the Fifth Avenue Coach Co. for its buses.

In this gearset there are only two shafts, the reverse motion being obtained by a pair of gears between the same two shafts which are connected by the silent chains for the forward motion. The chains are of ⅝ in. pitch and 3-in. wide. The sprockets on the primary shaft are free thereon, being mounted on Hyatt roller bearings, and are secured to the shaft when the particular speed is wanted by positive clutches of the internal and spur gear type. The secondary shaft is mounted on Hyatt bearings at both ends. The primary shaft is mounted on a Hyatt and a single-row radial bearing at the engine end, the radial bearing taking thrust in both directions. The pilot bearing is of the Hyatt type and at the driven end of the primary shaft there are a Hyatt heavy duty and a ball type of thrust bearing. The weight of the transmission is about 160 lb. and it has sufficient capacity, according to the manufacturers, for any size of motor bus now made. The housing is of cast aluminum, and the cover plate is on the under side so that the gears can be inspected from below. The advantage of the silent chain transmission is that it does not get noisy with use.

K. P. Governor

A truck engine governor of the gas inertia type has been brought out by the K. P. Products Co. of New York. It is a fitting which is inserted between the carbureter and the inlet manifold, and is claimed to closely regulate the speed of the engine and not to cut down the engine power. It consists of a plunger with a conical head B which is connected to the sleeve valve C by means of a cross rod passing through its stem. When the engine is at rest or idling, the cone and sleeve are held in their lowest positions by the coiled spring within the stem of



K. P. truck engine governor

the plunger, the pressure of which can be adjusted by means of the set screw. The kinetic energy of the gas rising through the governor presses against the head of the plunger and tends to raise the sleeve C, closing the ports D,D, through which the gas must pass on its way to the engine. As the ports become nearly closed, the speed of the gases passing by the plunger is reduced and their kinetic effect decreased. The space inside the governor is then placed in communication with the inlet manifold through the port X, the opening of which can be adjusted by means of a conical point screw. The depression in the inlet manifold naturally increases as the ports D,D are closed, and the suction effect due to this depression then holds up the plunger until, through the reduction of the speed of the engine, the suction effect again falls below the pressure of the spring and the plunger returns to its normal position. This governor is claimed to be smooth-acting and free from surging.

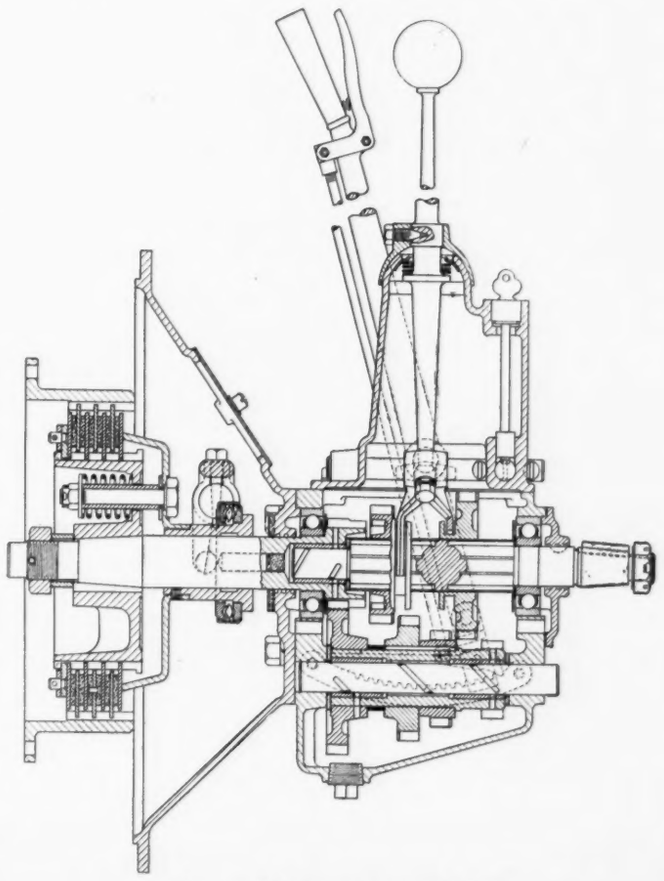
Clark Bevel Gear Axles

The Clark Equipment Co. is showing three new models of bevel gear axles of 1500-2000 lb., 2000 lb. and 5000 lb. carrying capacity, respectively. Including wood wheel hubs, drums and bearings the weights of the three axles are 324, 400 and 628 lb. The threads of the two smaller models are 56 in., while that of the larger one is 58 in. On the smallest and the largest axle two definite gear reductions are offered, viz., 5.66 and 5.1 in the case of the former and 8 and 7 in the case of the latter. The intermediate size comes with a maximum reduction ratio of 6.28 to 1. The spring centers on all three models can vary from 38 to 40 in., the standard being 39½ in. The brake drums are 16 in. in diameter. On the smallest axle there are only external brakes and on the largest only internal, while the intermediate size has both internal and external. Thermoid brake lining is used, unless the specifications of the customer call for other material. The drive and torque in each case are intended to be taken through the springs. The bevel gear set of the small axle consists of 4.25 pitch and 1.25-in. face gears, the numbers of teeth being either 9 and 51 or 10 and 51. The intermediate size has gears of 3.48 pitch and 1 5/16-in. face, with 7 and 44 teeth, while the large axle has gears of 3.33 pitch and 1¾-in. face, the members of teeth being either 7 and 56 or 8 and 56.

The drive shafts are of nickel steel and are of larger diameter at the wheel end than at the differential end, the axles being of the semi-floating type. The wheel bearings of the two smaller axles are of the double thrust ball type, while the larger axle has taper roller bearings at the wheels. The hub flanges are 7¼, 9 and 10½ in. in diameter, respectively. On the small axle the brake levers are outside the springs, while on the other two both sets are inside the springs. The bearings of these axles are claimed to be of very liberal size. Hard felt washers are used throughout the axles to prevent loss of oil. All bolts and nuts are U. S. standard.

New Covert Transmissions

The Covert Gear Co. has brought out two new transmission models, one known as Model JU, which is intended for heavy passenger cars and 1½-2-ton trucks, and the other known as Model EC, and designed for light passenger cars. The smaller transmission has gear faces ⅝-in. wide; the larger one, 13/16 in. The small transmission has ball bearings on the main shaft and plain bronze bearings on the secondary shaft, while on the larger model ball bearings are used throughout. The gears are of 3½ per cent nickel steel, case hardened. They are cut with 6-8 pitch teeth. These transmissions are made in unit powerplant models and come with multiple dry disk clutches. The disks of these clutches have driving teeth or serrations cut on them, both on the inside and the outside. These teeth are of 10 pitch. The transmissions are provided with ball-mounted, ball-handled shift levers, or what is often referred to as the cane type, and both models are furnished with locks.



New model Covert transmission

The housings are of cast iron. The Model EC is recommended by the makers for cars weighing up to 3000 lb. and the model JU for cars weighing from 3800-4500 lb. The brake levers on the transmission can be hooked up to either transmission or rear wheel brakes. Both models are furnished for speedometer drives.

In addition to the above models the Covert company makes a model RAP-4, a four-speed gear for 2-2½-ton trucks, which, however, is not a new design.

New Schebler Carbureter

A new Schebler carbureter of the air valve type is being shown for the first time. It has a fixed size of venturi passage, mixture regulation being effected by the opening of the air valve, which is a function of the vacuum in the intake. The primary air enters at the bottom of the carbureter and flows through a small venturi in which the fuel nozzle is located. Because of the small size of the opening around the nozzle, the air passes at high velocity and creates a strong atomizing effect, even at idling speeds.

Referring to the sectional illustration, A is the primary air inlet and B the fuel nozzle. As the throttle C is opened the air valve D also opens, automatically, against the pressure of spring E. Through the linkage F the metering pin G is lifted from its seat, which has the effect of increasing the flow of gasoline from the nozzle B. The air valve bell H is so shaped as to give the desired mixture characteristics for various throttle openings. The operation of the air valve is controlled and flutter prevented by means of the dashpot J.

When the throttle is suddenly opened wide, an additional supply of gasoline is picked up from the accelerating well K and forced into the nozzle through the passageway L. This prevents the "sputtering effect" sometimes noticed when the throttle is thrown wide open after the engine has been running steadily on part throttle.

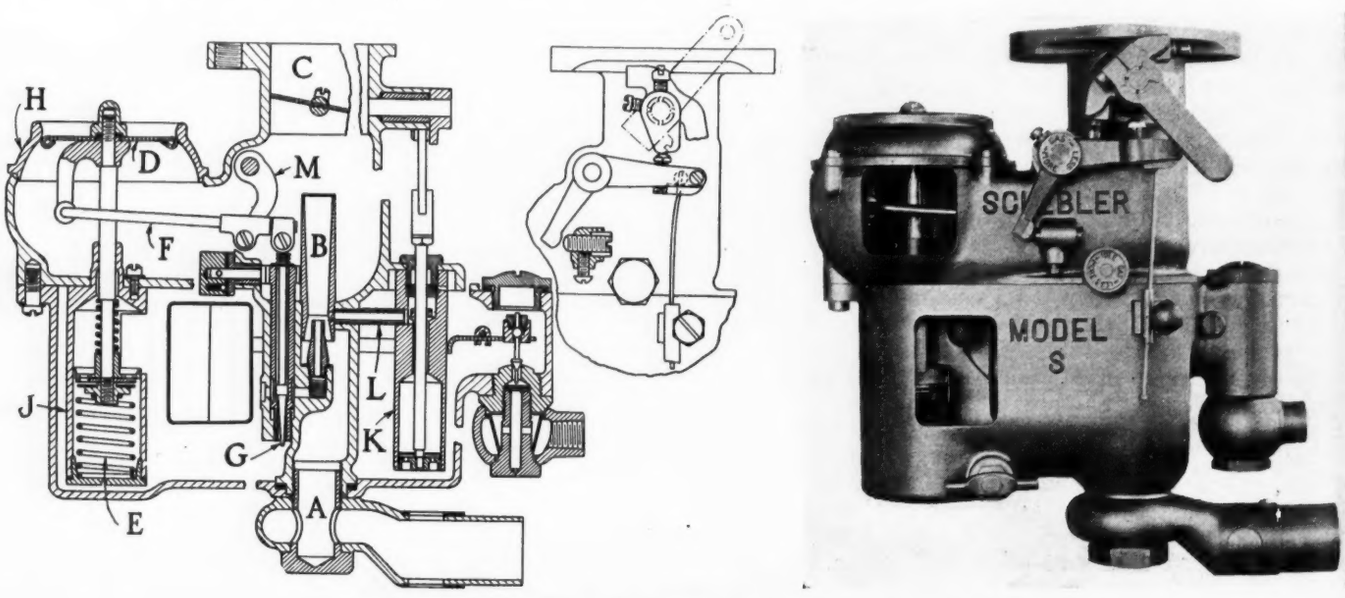
It will be noted that the fulcrum of the lever F is located on arm M, which is pivoted at its upper extremity. As the movement of the metering pin G is determined by the location of the fulcrum of lever F, any movement of arm M toward the air-valve will cause a greater proportional opening of the needle valve. The adjustment put in the driver's hands for meeting weather conditions and for cold starting is applied to a lever on the outside of the carbureter, which locates the position of arm M. For cold weather, the fulcrum point is moved toward the air-valve G. In warmer weather, or after the engine has become warmed up, it is moved to the position shown in the sectional view; that is, as far as it will go to the right.

A lever on the outside of the throttle shaft also comes in contact with an exterior lever connecting with arm M after the throttle has been opened to a predetermined point. This lever pushes the fulcrum point over toward the air-valve, increasing the richness of the mixture, to take care of the increasing load. The carbureter has two adjustments: one for idling, which raises and lowers needle valve G to the best initial position; the other for use at higher or running speeds, which determines the position of the fulcrum for arm F.

The mixture proportion characteristics of this carbureter are determined by the shape of air valve bell H and by the position of the fulcrum of link F. The initial position of each of these can be arranged to suit the individual engine, and with these variable, it is possible to govern the engine at any point of the speed range.

New Waukesha Engine

The Waukesha Motor Co. is exhibiting a new engine known as Model Y. This comprises all of the internal features of the 4 by 5¾-in. engine described in a recent issue, such as the aluminum pistons, radiated bearings, valve rotator, modified Ricardo combustion head, etc. But it is of the block type and has removable cylinder sleeves. It is made in two displacements, of 3¾ and 4-in. bore respectively, the stroke in both cases being 5¼ in. The change is made by using different cylinder liners. The model Y is a motor bus and truck engine and is designed to operate at comparatively high speeds. It has unusually smooth lines. The four cylinders, the crankcase and the bell housing are made in a single block, to which are bolted the cylinder head and the oil pan. Owing to the high speed (for a commercial vehicle engine) at which this engine operates, and the high compression used the weight (600 lb.) is comparatively low. A very sturdy crankshaft is used, all bearings being of 2⅛-in. diameter. The rear and center bearings are of the same size, the length of both being 2¾ in., and the front main bearings is of the same size as the connecting road bearings 2 in. in length. This simplifies the servicing problem.

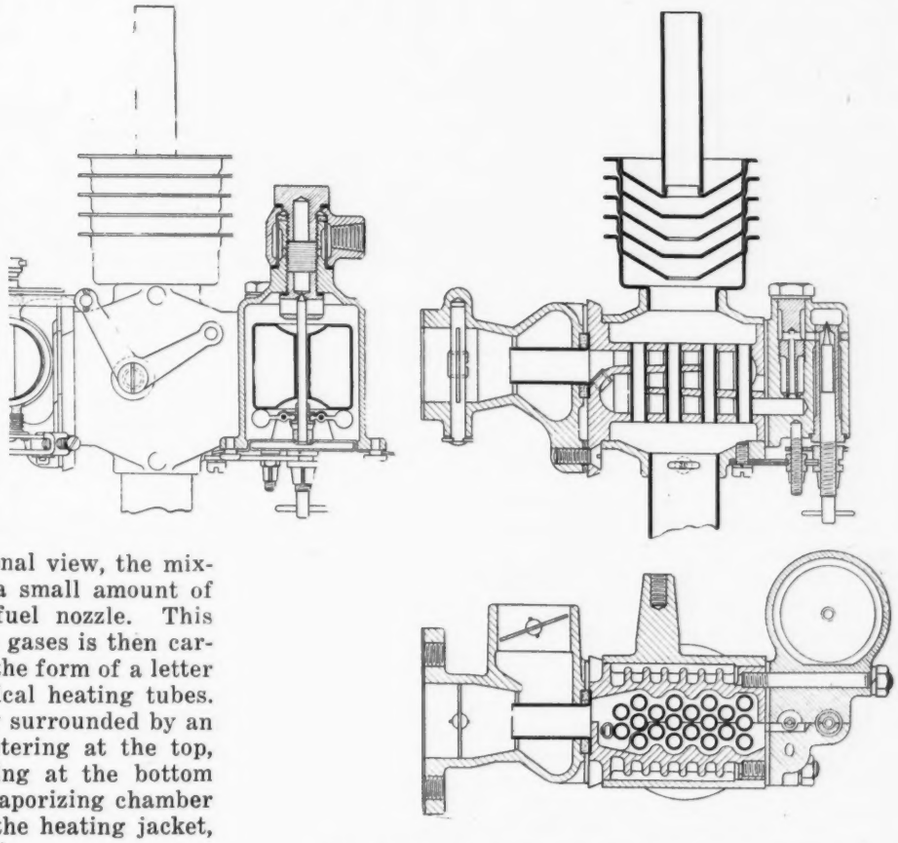


Sectional and complete views of the new Schebler air valve type carbureter

All of the accessories are located on the curb side of the engine, which facilitates inspection and adjustments.

The Bullard Carbureter

A carbureter embodying a new principle has been developed by The Bullard Machine Tool Co. and is exhibited in the accessories section. The idea underlying the design is that with present grades of fuel a large amount of heat must be imparted in order to insure complete vaporization. The unusual feature is the use of exhaust gases for spraying the fuel, no air coming in contact with the mixture until after it has passed through what may be described as the vaporizer portion of the carbureter.



Sectional views of new type Bullard carbureter

Referring to the longitudinal sectional view, the mixture is produced at the left side by a small amount of the exhaust gases blowing by the fuel nozzle. This mixture of sprayed fuel and hot spent gases is then carried through a vaporizing chamber in the form of a letter S, through which extend twenty vertical heating tubes. This vaporizing chamber is completely surrounded by an exhaust jacket, the exhaust gases entering at the top, passing around both sides and leaving at the bottom through a muffler. The sides of the vaporizing chamber are cast with flanges extending into the heating jacket, so as to increase the absorption of heat.

As the mixture leaves the vaporizer it passes through a short central injector tube, and air enters the carbureter around this tube. Just beyond this tube is located the throttle valve. There is a strangling valve in the air inlet which is interconnected with the throttle valve in such a manner that it remains fully open as long as the throttle is not more than half closed, so that the power of the engine is not interfered with. When the throttle is more than half closed and, as a result, the suction effect in the carbureter drops considerably, this valve is progressively closed, so as to keep up the depression. The inter-connecting linkage is plainly seen in the top view of the carbureter.

The metering orifice of the carbureter is adjustable by means of a needle valve. Referring to the longitudinal section, fuel from the float chamber enters the open space seen at the left hand side at the bottom. It then passes by the needle valve and through a sort of nozzle located adjacent to the needle valve, at the top of which it enters the vaporizing chamber. At the bottom of the nozzle the exhaust gases enter through a branch from the exhaust manifold. At the end of the first section of the vaporizer there is a drain hole, and any unvaporized fuel which may collect on the wall of the vaporizer at the turn may drain off through this hole into the injector tube.

Volumetric Efficiency High

From the above description it will be seen that with this system the fuel in the first place mixes only with hot exhaust gases, of which a comparatively small quantity is used. These gases, coming directly from the exhaust manifold, are under considerable pressure, depending upon the load on the engine, and the spraying effect therefore is probably considerably more energetic than in an ordinary carbureter. Only this mixture of fuel and spent gases is heated in the vaporizer, while all of the air is admitted to the inlet manifold without heating, hence the volumetric efficiency under full engine load should be high.

This carbureter has been developed for installation on Ford cars, and some tests made on the chassis dynamometer at the mechanical engineering laboratory of Sheffield Scientific School showed a fuel consumption of 1 gal. to 30.5 miles for a Ford sedan under the most favorable conditions, that is, at a test speed of 10 m.p.h. At 20 m.p.h. the efficiency was practically the same, the mileage on 1 gal. of fuel being 30.2.

It is not the intention of the Bullard company to confine itself to the replacement field, but it will also make the curbureter for manufacturer's equipment.

Bullard Bumper and Shock Absorber

The Bullard Machine Tool Company has recently established an automotive department and has brought out a bumper and a shock absorber, of which samples are exhibited. A feature of the bumper is that it possesses a great deal of cushioning power and at the same time sufficient strength to protect the car from injury in case of collision. We expect to print an illustrated description of this bumper in an early issue. The shock absorber is of the hydraulic type and has the peculiarity that when the spring is under normal load, as in running over comparatively smooth pavement, it does not restrain the free action of the springs. The bumper mechanism comprises a crank and connecting rod; when the load on the springs is normal, the crank is in dead center position, and any slight play of the springs produces practically no motion of the piston actuated by the crank and connecting rod. On the other hand, if there is considerable spring throw, the piston is compelled to make a

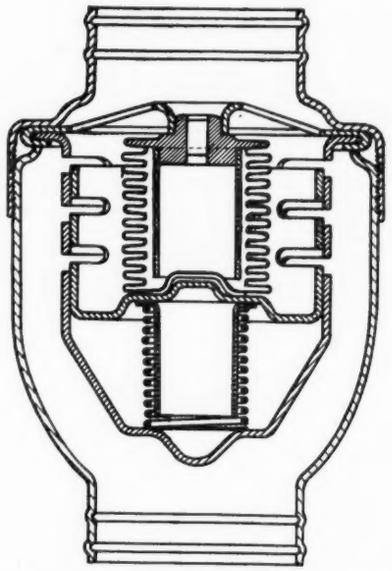
stroke of appreciable length. The piston is surrounded with oil on both sides. There is a ball check valve in the piston head, which allows the oil to flow through one way, which normally corresponds to the compression of the springs. During the return motion the check valve closes, and all of the oil is then compelled to flow from one side of the piston to the other through a small fixed passage parallel to that controlled by the check valve. The return of the spring is therefore retarded. This shock absorber then allows free action of the spring on smooth roads and exerts a rapidly increasing checking action as the bumps imparted to the wheel increase.

U. S. Front Axle with Brakes

The U. S. Axle Co. exhibits a front axle with front wheel brakes of the mechanically operated type and of a new design, on which a patent has recently been applied for. The brakes are of the internal type and are expanded by a toggle mechanism. The brake rods run underneath the axle and operate a lever mechanism under the axle end by which the brake operating force is transferred to the toggle mechanism at a point in the axis of the king pin. Unsightly connections to the brake with universal joints in them are therefore done away with. The brake and expanding linkage are inclosed by the brake cover. This axle is intended for buses and large passenger cars and will be made in a number of sizes. We are promised a drawing of the axle for use in an early issue.

Bishop & Babcock Aquastat

A thermostat for use in the cooling system embodying an unusual arrangement of the valve is exhibited by the Bishop & Babcock Co. As will be seen from the accompanying sectional view, the valve is of the cylindrical registering type and is made with a head at one end which is held between the end of the Sylphon bellows and a coiled spring. When the water in the system—and particularly that around the bellows—is cold, the spring holds the valve practically closed, but as the water heats up the volatile fluid inside, the bellows expands and causes the valve to open, allowing circulation to start. It will be noticed that the valve is of the balanced type, the pressure of circulation having no tendency to either open or close it. One advantage claimed is that when the valve is nearly closed, the pressure in the circuit between pump and valve is increased, and as a result the power consumed by the pump is decreased. The device is acorn-shaped and is inserted in the radiator



Cross section view of Bishop & Babcock Aquastat

connection from the top of the engine, both ends being corrugated for hose connections.

Rayfield Carbureter

Benecke & Kropf Mfg. Co. exhibit a new carbureter, Model ST. This is of the strangling tube type, there being a floating strangling tube surrounding the fuel nozzle and connected to a piston in a dashpot. There is a starting fuel nozzle above the throttle and an air bleed to same. We are promised a sectional drawing of this carburetor and expect to print an illustrated description in an early issue.

Textolite Gears

A new kind of non-metallic gear for front end drives is being exhibited by the General Electric Co. Textolite gears, as they are called, are made from laminations of heavy duck, specially woven for the purpose. These laminations are treated with a synthetic gum of strong adhesive qualities and are then heated and solidified by the application of heavy pressure. The result is said to be a dense water and oil resisting material with sufficient flexibility to absorb tooth shock but of sufficient hardness to withstand abrasive wear. The material is insoluble in practically all the ordinary solvents, weak solutions of acids or alkali and boiling water or oil.

Brazilian Congress Urges Alcohol Cooperative Societies

THE Brazilian Congress of Coal and Other National Fuels, inaugurated in Rio de Janeiro, has just recommended the establishment of alcohol cooperative societies in important alcohol centers, the use of alcohol-driven vehicles by the Government and favors for alcohol-driven vehicles and motors, and has made other recommendations toward promoting the use of fuel alcohol.

Although pure alcohol is now used in some tractors and trucks in Brazil, it is not considered suitable for passenger automobiles, and it is proposed to organize a company in Recife for the manufacture of motor fuel from alcohol sulphuric ether, and pyridine in the following approximate proportions: Alcohol, 55 per cent; ether, 44 per cent; pyridine, 1 per cent.

It is said that 112 gallons of 95 per cent alcohol will make 100 gallons of this fuel (the ether used being obtained directly from the alcohol), which is claimed to be the equivalent of gasoline in starting flexibility and miles per gallon, and to be suitable for gasoline engines. It is estimated that nearly 14,000,000 gallons of this motor fuel could be produced annually in Brazil from sugar finals, a quantity equal to approximately 81 per cent of the gasoline imports for 1921, which amounted to some 17,000,000 gallons.

Rise of Service Coupes and Sport Models a Feature of Show

Closed bodies show great similarity of line. Use of fabric in body construction gains many more converts. Standard phaetons and roadsters few in number. Greater display of bright colors.

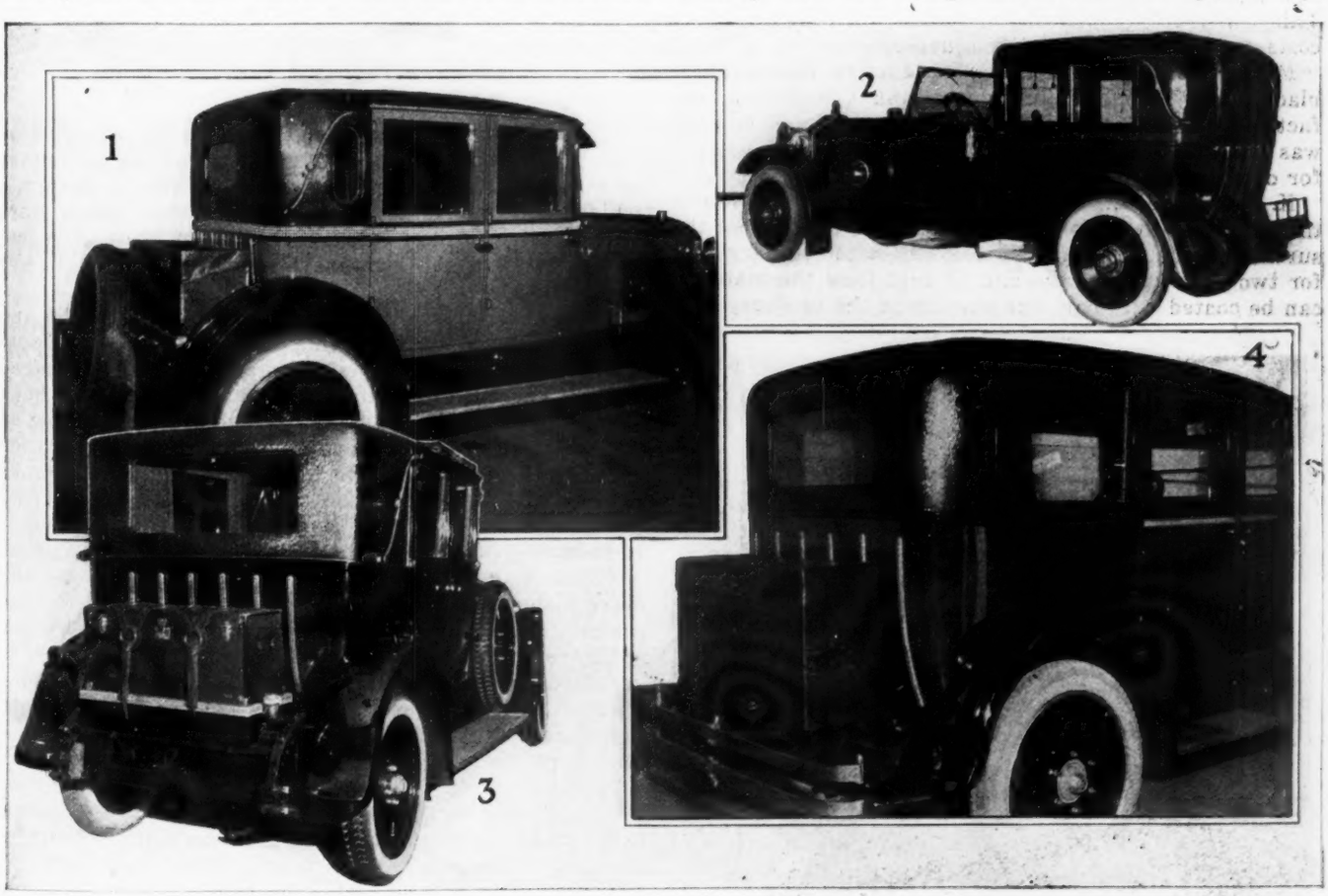
By George J. Mercer

BRIGHTER colors mark the display of cars at the Palace this year and with this change comes a lavish use of nickel trimmings, added equipment and appointments. Another feature of the show is the increase in the sport type car at the expense of the conventional phaeton. Some manufacturers have no phaetons on exhibit and this year marks the passing of that type as the chief body model of the industry. Roadster models are conspicuous by their absence and this no doubt is due to the ascendency of the sport phaeton.

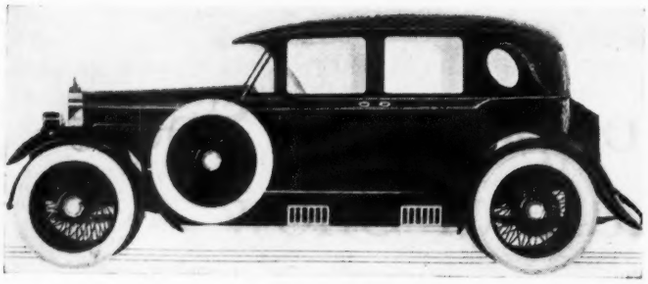
While there has been a decline in the number of standard phaetons and roadsters there has been a decided gain in the number of business models brought out and whereas their first appearance was in two-passenger jobs, this year models with greater seating capacity are shown. On the whole closed body models do not have much variation in their lines, so that it is possible to describe the product of one company and apply the description to many others.

The use of fabric as a body covering seems to have gained greatly as evidenced by closed-car bodies at the Show, and we may expect to see this development carried even further in the future.

Many cars are being shown with the spare wheel



1—Stearns inside drive cabriolet with small oval quarter window and trunk at the rear. 2—McFarlan cabriolet, showing rounded back end. Spare wheel at the front and six mudguards, the two additional used for keeping the step clean. 3—Moon inside drive cabriolet with spare wheel at front. 4—New Chalmers inside drive cabriolet



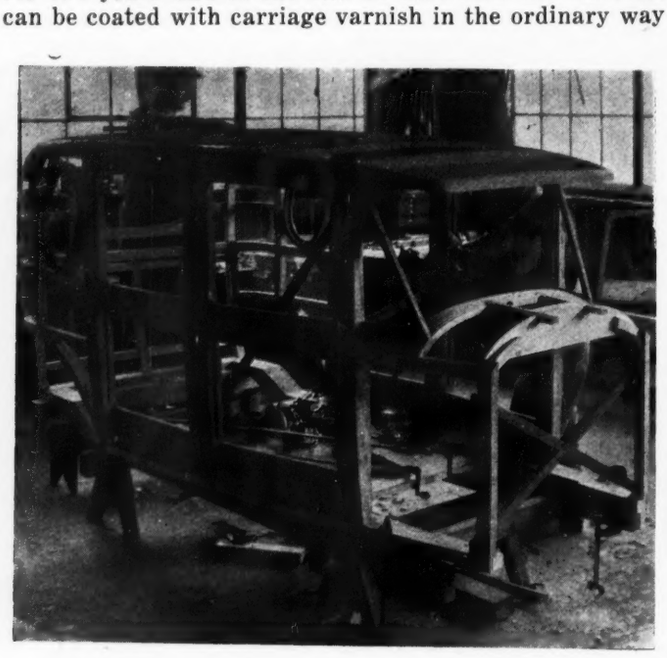
Meritas leather cloth body mounted on Packard single-six chassis

mounted on the side and disk wheels predominate on all models. Permanent tops show a distinct gain. All these and many minor changes are the leading features which stand out and make the Show, from the standpoint of bodies, one of great interest.

The one novel body construction feature which is being shown is at the Hotel Commodore. This body, which is mounted on a Packard single-six chassis is made with the conventional wood frame but in place of metal panels a foundation of No. 19 two-mesh wire is used. One thickness of 3-ply buckram is placed over the wire mesh and then the entire body is covered with Meritas leather cloth. The outer covering is not pasted or glued to the frame but stretched tight and fastened under the mouldings which are also covered with the same kind of material but of a different color. The advantage of this form of construction is that the body is lighter in weight; has a more permanent and less easily damaged surface coating and its good appearance is kept more easily. This construction will aid materially in reducing body costs and it is also absolutely sound-proof.

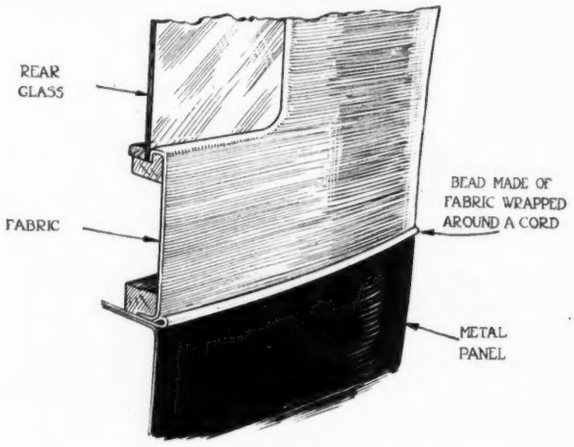
Meritas leather cloth is a reproduction of the finest black, highly finished, long grain landau leather manufactured by the Standard Textile Products Co. The body was made for their concern by a Detroit body company for demonstration purposes.

K. L. Childs of the Standard Textile Products Co., who is the patentee of this form of construction, claims that the surface of this material will look well with ordinary care for two years and at the end of that time the material can be coated with carriage varnish in the ordinary way and then will last for the life of the body. The interior trimming is also the product of this company. The rear seat is covered with a waterproof material which has a flowered silk effect. Curtains are the same material but double faced, and the driving seat is covered with an imitation of morocco leather, still another Standard Textile product. The trimming design is plain with a center pipe.



Conventional wood frame for Meritas leather cloth covered body

The attention which this new construction attracts is due no doubt to the fact that the use of fabric for covering has made converts for the past two years and at the Palace show there are numerous examples of bodies that are using this construction in various ways, but based on the fabric as the finishing part. The examples here shown are a few of the bodies so finished. There are others which are cheaper in finish than those illustrated and several that are of high grade body work.



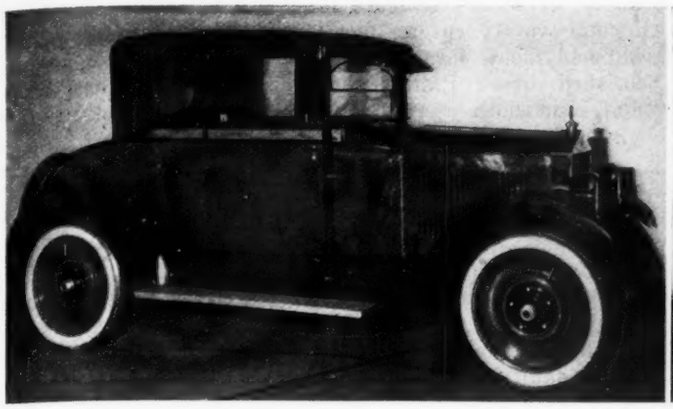
Details of Meritas cloth body construction

There is one advantage of this form of construction that will appeal to manufacturers, that is the advantage or rather quality which is inherent in a pliable material, which will enable that which is with steel panel work an expensive form of construction, to be made even less expensive than the straight lined, conventional bodies are now.

A rounded surface with metal covering means die and tool expense. With fabric this only means the additional labor of making the frame understructure the required shape. These illustrations show that advantage has been taken of the manufacturing latitude above mentioned and we can look forward during the coming season to see changes in closed-body models. This will tend toward making the lines of the bodies less severe and boxlike.

Taking standard practice as it is to-day, there is a stereotype pattern which is followed by the majority of body manufacturers and a general description of any one make of body is nearly applicable to quite a number of others. The use of a flexible material for panel work will free the designer from the prevailing tendency to keep body lines of more or less puritanical severeness.

Last year the Show had several cars of the business type featured, and the number has been augmented this season by others. The use of fabric is the medium which several have used to eliminate costs in covering the rear and rear side upper panels. These bodies vary according to the trade that the manufacturer has in mind soliciting. Some are simply made for a price and do not attempt to add anything which will not spell utility. Being brought out before the market is clearly defined, they are being built with parts that are made for the roadster and consequently show some crudeness in appearance when the



Moon five-passenger coupe with fabric rear and back quarter

Packard five-passenger coupe

feature of price is not kept in mind when looking them over.

Others are more of the conventional coupe style and the trimming and appointments are somewhat more luxurious. However, the acceptance by the public of the grade which they are willing to pay for will in time establish this model more definitely.

No doubt that which is required is value for the price and this will not permit the addition of any except strictly utilitarian features. On most of these bodies there are no dome lights but regulators are used with the door glass. Leather is used for the trimming of the cushion and seat back and a wool cloth above the seat line and the headlining. A pocket compartment is generally arranged back of the seat. This is useful as well as being necessary because these bodies are made with seat room for two, and to have a body look well it is necessary to have the body longer from back to front than just room for the occupants. The height needed for head room will make the body look very high unless some additional length is given for balance.

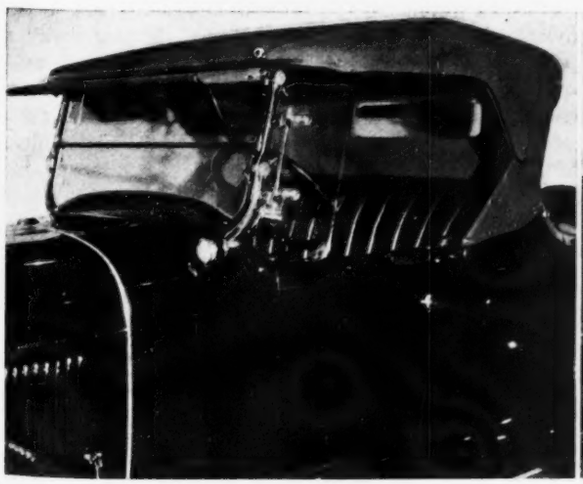
Better Balance of Line Needed

On some of these bodies insufficient attention has been given to the rear end. Experience has shown that only those roadsters looked well which had this part of the body big and massive looking and it should be much higher on many of the business bodies shown. This will help in two ways; it will minimize the apparently too great height to the roof by raising the line from which the basis of comparison is made and it will give a more pleasing appearance as well as more useful luggage space. The use of fabric to cover the upper back and sides is satisfactory. This side quarter is without any window opening to break up the expanse. Metal used here makes it look cumbersome and the shape is more clearly defined with leather cloth goods provided that they are of a bright finished lustre and are fairly well finished where joined at the belt line.

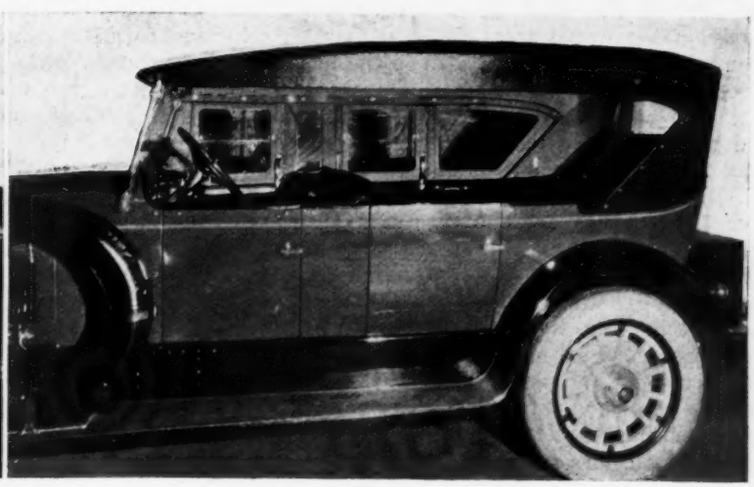
The Budd body has one of the best looking finished joints that is being shown. Here the fabric is assembled to a separate panel which is inserted and the joint is hidden by a generous size pipe which is applied so that the method is concealed.

The experience of the writer is that the best way to assemble the fabric is a method similar to that shown. For production it is not possible to use applied mouldings without an increase in cost which will be prohibitive for low-priced work. To apply the fabric and fasten indifferently where it joins the metal simply spoils what has been a meritorious beginning. It will be reasonable to predict that the assembled section completely made up will be used. This also is along the line of advanced body production methods, because the sectional assembly can be used at any time to save transportation costs by shipping knocked down.

The inside drive cabriolet is represented in numbers which show that it is finding favor and there is no doubt that now that the quality of the material used for the covering has improved, so that it not only is a perfect duplicate of top leather but will not shrink and change after being applied, that we will see the use of fabric very much more general during the coming season. The illustrations cover some of those exhibited and they show



Buick roadster showing fabric visor and wings to windshield



Case phaeton showing storm curtains with polished plate glass window and permanent roof. Extra tire at the front

a slight increase to the round of the roof and much more round to the back upper rear corners than usual.

Some of the manufacturers refer to this body as the touring sedan. In a sense this fills the understanding. We know what a sedan is and this type of body is similiar to a sedan with a fabric upper body and is essentially fitted for touring. There is ample space inside and the trunk at the rear will provide for emergency or extra necessities. The more rounded exterior surfaces lend an air of going back to old coaching days as we know of them from pictures. This thought is carried out by the luxury of the interiors. Cushions are deep and comfortable and the trimming design is a departure this year and a return to the older way of interior finishing. The straight pleat which has held for all body styles for so long has declined and the plain cushion and back are the general rule. Cushion and back show a pipe or dividing line in the center, sometimes divided into three, as the sketch of the Pierce-Arrow shows. Here the cushions are really separate and held to a common base at the seat frame.

Tilting Front Seats

The five or four passenger coupe with two doors and tilting front seat as illustrated by the Packard, Cole and Nash show the extreme diversity that this type includes. This form of construction is in more favor this year than last in that it seems now to be more of a reality than an experiment. Possibly the business coupe for two passengers will tend to take the place of the offset seat type and create the need for a more commodious and larger body. This would seem to be a sensible solution of the coupe seating which has been in the past almost anything from two to four. Now that the business body is distinctly for two passengers, there will probably be more of the larger size bodies made for the other uses which do not call for a sedan size.

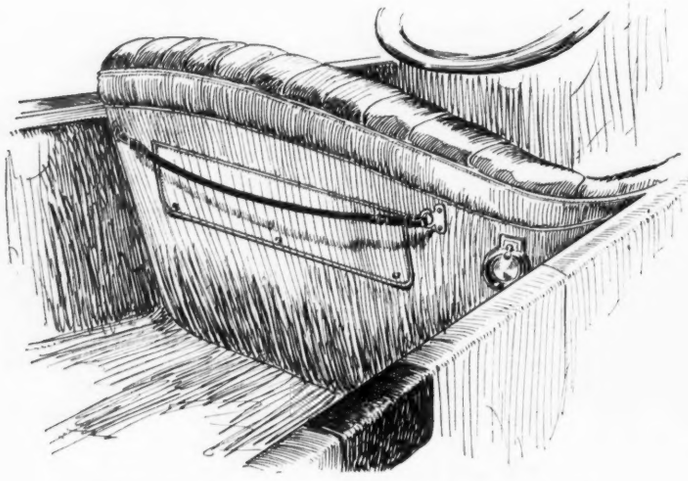
Other bodies are the conventional sedan with straight front, four doors opening from the center and fabric roof and visor. The chief difference this year is that provision for the trunk at the rear and the spare wheel at the front are quite general. Exterior lines are much the same. Interior trimming shows many with plain cushions and backs, and the material used is generally two toned brown or gray and velour and wool fabrics share about equal. Vanity cases are not used nor are corner lights often seen but just the single dome light is used. Painting usually is in quiet colors and striping is quite common.

There are a few Berlines and these usually have slant front windshields. The painting and interior appointments of these are more luxurious than the sedans and include vanity cases, toggle grips and occasionally gold finished metal interior parts, but usually these are dull finished silver. Plain trimming is the rule in these bodies and broadcloth is used quite often. Examples are furnished by Lincoln, LaFayette, Pierce and others.

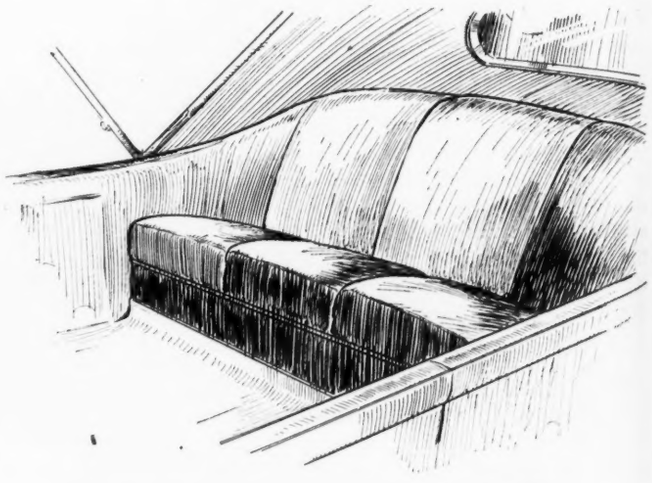
The town car type has representatives. Usually this body is not classed as a production job and, therefore, does not show here. But there are both true cabriolets and broughams.

It is apparent this year that manufacturers are willing to make their display cars look a little more attractive by brighter colors, added equipment and appointments and lavish use of nickel for lamps, radiators and windshields. These additions are more generally applied to all models this season. Heretofore the practice was confined to open car bodies, but apparently it has found favor with the public and is being carried out more generally. It is an exception rather than the rule to see an exhibit with all black cars. Those who do follow the older custom do not suffer so much by contrast as their neighbors often times have sufficient brightness to balance.

It must be admitted that the shows are now more artistic in their display of leads in colors and bright finish than in former years, and it proves that the general average of artistic taste is higher. No single display was lacking in proportionate fitness, and it was all added with a definite knowledge of delicacy and good taste.



Buick pocket compartment in back of front seat

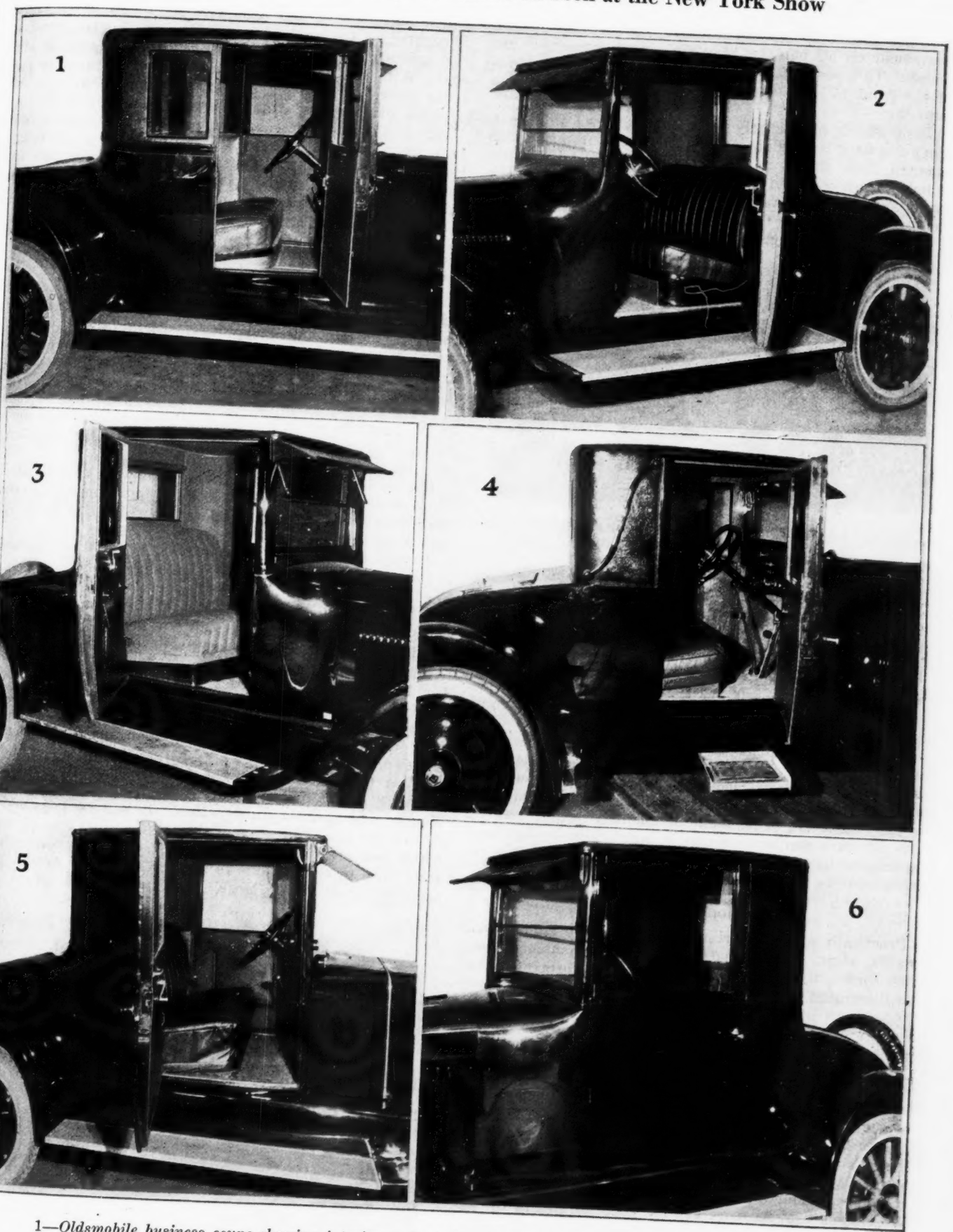


Pierce-Arrow rear cushion in three divisions

The display feature is the use of harmonious bright colors. Of these maroon is in the lead in numbers. Black mudguards and other surfaces that can be enameled, and nickeled parts are more in evidence. The radiators as a rule are nickeled and the latter finish is used often for the windshield standards. Headlights with a few exceptions are drum shaped and of large size and nickel finish predominates. Cowl or dash lamps are the rule and they usually are set forward of the shield. Ventilators in the cowl at the top are so common that they are deemed a necessity.

Steps and cycle mudguards are more numerous than at any time previous. The size of the steps has been increased; the flange at the sides are higher and the use of a rubber pad on the step is fairly general and with it a wiper bar for scraping off the mud. The Cleveland and the McFarland have exceptional seat arrangements, the former has the two steps connected by a metal board and the latter has six guards, the two extra serving to keep the mud off the step. Both examples are very good for the purpose intended and add distinction to the car.

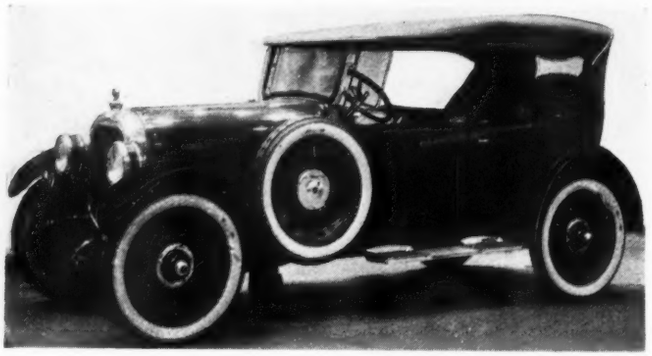
Examples of Closed Body Construction Seen at the New York Show



1—Oldsmobile business coupe showing interior and window in side quarter. 2—Hupmobile business coupe showing interior. 3—Chevrolet business coupe showing interior seating. 4—Liberty business coupe with step and cycle guards. 5—Columbia business coupe showing interior. 6—Gray business coupe

Carrying the spare wheel at the front is much in evidence this year. This is European custom which has never found favor in this country until this year. Its purpose is to make accessible the trunk which has become general equipment on all but the very long seven passenger car bodies. This year more cars have the runboard shortened at the front to allow the spare wheel to set in without a cutout.

Disk wheels have surely come to their own this year. They are used largely on all cars, but the sport model has adopted them almost to the exclusion of the wire wheel which formerly found favor on this type of car. The trunk space at the rear is usually a permanent fixture and not a folding rack as formerly. This trunk rest is either a platform made integral with the body or a bright metal



Chandler sport phaeton with connecting steps and wheel at front

platform which is fastened to the chassis and fills the space beyond the body and over the gas tank. The trunk guards attached to the body are usually of the conventional white metal flat type, but some bodies have wood strips 1-in. wide with natural finish.

The general design features are in keeping with the prevailing styles that appear in the show rooms, but the tendency to solidify the trend of making the open car more of a dandy, or so-called sport type, is in great evidence here. The recognized conventional phaeton body was never so little to the fore as at this time. Some manufacturers show only their sport model and while we may feel that an old friend is passing out when the phaeton ceases to be the foundation or keystone of quantity output, still we have no other comparative case in which a model has been superseded by a conversion that changes it from the reliable standby to a pride of fashion.

Sport Model Equipment

Practically all the sport models have large lamps, cycle guards, steps, spanish leather trimming, fashioned plain with cord divisions in place of the older form of plates (as illustrated by the Pierce-Arrow which has the cushion divided into three distinct parts), trunks at rear, spare wheels at the front and disk wheels. Painting is usually in two tones and sometimes in three.

It is common practice to use striping on the body and sometimes on the hood. Disk wheels are always striped. Tops are made of a khaki colored material which gives a favorable appearance to the car, although a rough material is not as durable for use as one which is smooth coated. The Flint phaeton at the Commodore has a khaki colored top of glazed fabric.

The permanent top for open bodies has gained in use. The drawback to its more general adoption lies in the expense incurred in shipping. Some manufacturers arrange for this by having their tops made at the point of destination.

Storage for storm curtains seems to be best provided for by a compartment at the back of the front seat. These compartments are usually provided with a leather flap which buttons over the opening. Examples of this are illustrated. In a few bodies the curtains are placed under the rear seat, but in no case are curtains placed in the roof. With the permanent roof better storm curtains are being provided, and the use of plate glass in place of pyrolene has one good example in the Case open body.

All open bodies have robe rails and foot rests and a few have lights for the tonneau. The Paige has a combination hand and coat rail and side hand rails as well as locker space at the rear of the front seat. There is one example of a body with a second cowl and one or two with a bevel edge. Both styles have passed out temporarily.

Uniform Body Lines

The general lines of the bodies shown are uniform with moderate rounded rear corner, flat top edge and rounded surfaces which are never extreme. Windshields are usually two piece, slanted about 17 deg., with a fabric visor of the same material as the top goods and side wings. The overlap door construction is very general and the doors have both inside and outside handles.

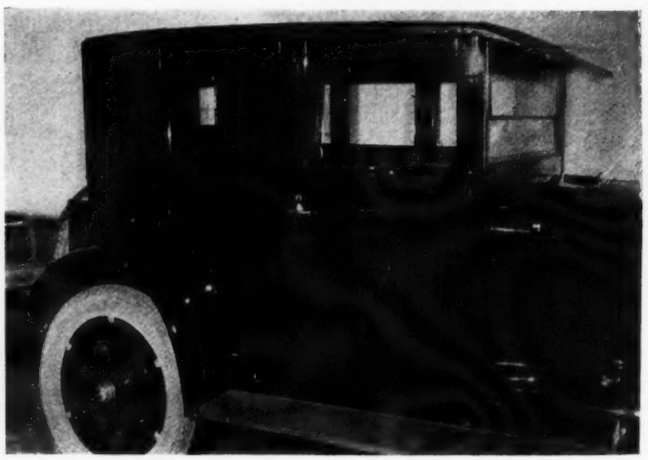
There are two examples of the California top idea; one on the Franklin which has glass windows which slide open for ventilation and panels which are removable for summer use.

The roadster never had so sparse a showing as this year. They were uniformly good looking but apparently the sport phaeton is making the near future of this body design problematical.

To sum up, therefore, it may be said that the business closed body is a distinct type planned for utility. Dodge and Dort have bodies which they designate as business cars which are five-passenger jobs. There is no doubt that some business requirements call for more than the conventional and now accepted two-passenger body.

Another point is that the use of fabric for roofs and for the covering of the back and side quarters is much more general and indicative of even larger uses in the future. The experimental Meritas body at the Commodore is a further step in this direction than any one else has traveled.

What we may expect in the future is not any changes of large import but a utility trend that will make for simpler and cheaper construction. It will be possible to do this and yet refine some of the angular lines and corners which now seem accentuated because we have a somewhat sterotyped production due to the duplication of nearly the same design by such a large number of manufacturers.



Nash five-passenger coupe

12,357,376 Cars and Trucks Registered in United States

Gain of 1,851,716 over last year. Increase of 17.6 per cent. One car for every 8.7 persons. Fees paid by motorists exceed $150,000,0000. Heavy production and old cars brought back into use after depression account for tremendous 1922 registration.

CAR and truck registrations in 1922 exceeded by nearly 800,000 the largest estimates made at the beginning of the year. This story gives the totals for all of the States and is the first 1922 registration information given to the industry from any source.

The enormous gain in 1922 can probably be accounted for by the fact that many people brought back into use motor vehicles which they had put into storage during the business depression of 1921. The record-breaking production of 1922 also contributed to the big gain.

THERE were 12,357,376 cars and trucks registered in the United States on Dec. 31, 1922, according to a survey just completed by AUTOMOTIVE INDUSTRIES. This is a gain of 1,851,716 over the 1921 registration, an increase of 17.6 per cent. There are now 8.7 persons per car in the country.

New York has gained the honor of being the first State to pass the 1,000,000 mark. It leads in total number of cars and trucks with 1,000,732 and also has the largest numerical gain over last year with 188,701.

The percentage gain over 1921 was largest in the District of Columbia and Washington, the increases in these two States being 38.4 per cent and 31.1 per cent respectively. Fees collected by the various States from motor taxes totaled more than $150,000,000, exceeding the 1921 figure by some $30,000,000.

The figures presented here are very nearly accurate in every case, but a few detailed changes will be necessary when all the States have completed their registration compilation work. Final revised registration figures will be given in the Statistical Number of AUTOMOTIVE INDUSTRIES which will appear Feb. 22, 1923.

The tremendous total shown by the 1922 figures is considerably larger than predicted by anyone in the industry. It was commonly thought that the 1922 registration figures would show something like 11,600,000 cars and trucks in use, but the actual number exceeds those estimates by more than half a million.

Two factors probably account for the unexpectedly large registration gain. A year of high production and rapid sales has naturally resulted in a material registration increase. Many people, moreover, have probably brought into use again cars and trucks which they did not operate during the depression year of 1921. The excellent selling year accounts for a normal increase that was expected, while to the second factor mentioned may be attributed the abnormal result which the figures show.

Every State had more cars and trucks in use on Dec. 31, 1922, than on the same date in 1921. This is in contrast to the situation a year ago when four States showed lower figures than in 1920. The delinquents last year were Georgia, South Carolina, Montana and South Dakota. These four States together showed a decrease in 1921 of 17,734 as compared with 1920. This year they show a total gain of 27,539 over 1921, a net increase of 9805 over the previous high point of 1920.

The greatest numerical gains were made in the high registration states as usual. New York, California, Ohio, Pennsylvania, Illinois, Michigan and Massachusetts lead the list of actual gains in the order named.

The first ten States in total registrations are as follows:

New York	1,000,732
Ohio	861,000
California	842,663
Pennsylvania	829,737
Illinois	786,190
Michigan	578,980
Texas	526,670
Iowa	499,446
Massachusetts	449,838
Indiana	472,000

New York has far outstripped Ohio, which has always been a keen rival for registration leadership. California has displaced Pennsylvania as the occupant of third place, while Massachusetts has passed Indiana in the list.

Massachusetts and California have made greater percentages gain than any of the other high registration States. Each has 24.8 per cent more cars and trucks than last year. Out of the ten States having the highest total registration, four are also in the first ten in percentage gain. These four are Massachusetts, California, New York and Michigan.

New York, which already had 812,031 cars and trucks in 1921 has jumped up 23.2 per cent in 1922. This fact

is an interesting commentary on the discussion about a saturation point. When the State already having the largest automobile population in the country still can jump its registration nearly 25 per cent in one year, it isn't sensible to talk seriously about a saturation point.

The figures as a whole do not show any radical changes in trend in any particular section of the country. An examination of the registration figures for past years shows that there is much sameness, relatively speaking, from year to year.

The statistics bear out the general idea that market studies, based upon registration figures, can be made with a reasonable degree of accuracy if the trend in automobile and truck use by States is studied over a period of years. Predictions cannot be made with entire accuracy, of course, but a study of trends and past performances will help materially in planning future merchandising activities.

Uniformity Needed

Registration figures are becoming more comprehensive and more accurate throughout the country. Nearly all the States segregate car and truck registrations in some form, and there is a marked increase in interest among State authorities in putting out accurate and useful registration data.

The utter lack of uniformity in registration practice, however, makes the segregated figures of comparatively small value. There are at least fifteen or twenty different definitions of "commercial vehicle" in use, so that the total of truck registrations is a very inaccurate figure at best. Some States make the division between passenger cars and trucks on a basis of mechanical features, calling all pneumatic tired vehicles "passenger cars," for example, and all solid tired vehicles "trucks." Other States make the division on a basis of use to which the vehicle is put, the divisions being "pleasure" and "commercial."

Tractors and trailers are included in truck registrations in some States and are left out in others. Sometimes tractors are included and trailers left out, or vice versa.

So long as this lack of uniformity prevails, the registration figures can never have anything like their maxi-

Registration of Motor Vehicles

State	Total Registration of Cars and Trucks	Passenger Cars	Trucks	Motorcycles	Total Fees
Alabama	90,052	80,183	9,869	638	$2,000,000*
Arizona	38,625	.....	.....	.....	215,000*
Arkansas	83,583	76,583	7,000	240	998,531
California	842,663	803,710	38,953	16,074	8,299,660
Colorado	162,170	151,420	10,750	27,090	992,000
Connecticut	156,000	130,000	26,000	.....	3,000,000
Delaware	24,500	19,500	5,000	426	426,000
District of Columbia	85,425	76,593	8,832	2,494	367,773
Florida	117,000	97,000	20,000	.....	1,000,000*
Georgia	144,226	126,900	17,326	.....	2,000,000*
Idaho	53,900	49,422	4,478	703	819,291
Illinois	786,190	686,466	99,724	8,156	7,882,323
Indiana	472,000	415,000	57,000	7,000	3,000,000
Iowa	499,446	468,099	31,347	3,563	7,799,890
Kansas	327,185	303,717	23,468	2,315	165,738
Kentucky	152,870	135,702	17,168	1,097	2,138,716
Louisiana	102,284	87,003	15,281	509	1,756,226
Maine	91,710	78,453	13,257	.....	1,500,000
Maryland	162,570	150,669	11,901	4,956	3,200,000*
Massachusetts	449,838	384,123	65,715	11,675	5,685,527
Michigan	578,980	518,558	60,422	5,163	7,807,145
Minnesota	380,525	341,299	39,226	3,238	6,532,042
Mississippi	76,300	70,430	5,870	95	3,016,000
Missouri	391,669	351,686	39,983	.....	3,498,957
Montana	62,649	55,681	6,968	397	619,101
Nebraska	256,654	233,658	22,996	1,845	3,023,071
Nevada	12,647	10,000	2,647	112	120,937
New Hampshire	48,446	41,496	6,950	1,880	1,246,229
New Jersey	337,700	254,000	83,700	9,300	6,475,000
New Mexico	25,473	.....	.....	.....	350,000*
New York	1,000,732	779,964	220,768	25,161	12,718,074
North Carolina	182,550	163,600	18,950	1,190	2,826,075
North Dakota	99,100	96,127	2,973	766	699,000
Ohio	861,000	741,000	120,000	14,300	7,864,602
Oklahoma	249,659	.....	.....	952	2,729,169
Oregon	134,566	123,831	10,735	3,206	3,340,446
Pennsylvania	829,737	763,916	65,821	19,316	12,531,582
Rhode Island	66,500	53,489	13,011	.....	1,100,000*
South Carolina	95,978	88,400	7,578	605	741,714
South Dakota	125,233	116,136	9,097	660	107,960
Tennessee	135,745	119,361	16,384	861	1,589,824
Texas	526,670	.....	.....	3,410	4,052,456
Utah	49,156	41,935	7,221	725	749,272
Vermont	43,881	41,241	2,640	856	781,982
Virginia	169,000	146,000	23,000	.....	2,900,000*
Washington	243,157	211,216	31,941	.....	4,000,000*
West Virginia	112,752	.....	.....	1,361	2,000,000
Wisconsin	388,044	361,222	26,822	5,918	4,153,376
Wyoming	30,636	27,409	3,227	305	316,849
TOTALS	12,357,376	10,072,198	1,331,999	188,558	$151,137,538

*Estimated.

Numerical Registration Gain

Dec. 31, 1921—Dec. 31, 1922

New York	188,701
California	168,833
Ohio	140,368
Pennsylvania	140,148
Illinois	115,756
Michigan	101,943
Massachusetts	89,106
Indiana	71,658
New Jersey	64,706
Texas	59,054
Washington	57,798
Minnesota	51,825
Wisconsin	46,203
Missouri	45,232
Iowa	38,918
Kansas	35,876
North Carolina	33,866
Oklahoma	28,359
Virginia	28,000
Kentucky	26,499
District of Columbia	23,680
Maryland	21,998
Louisiana	21,784
Florida	19,163
West Virginia	18,858
Tennessee	18,720
Connecticut	18,474
Nebraska	16,928
Colorado	16,431
Oregon	16,241
Arkansas	16,137
Maine	14,190
Georgia	12,284
Rhode Island	11,543
Mississippi	11,161
Alabama	7,709
Vermont	6,916
North Dakota	6,456
New Hampshire	6,407
South Dakota	5,959
South Carolina	5,432
Wyoming	4,017
Montana	3,864
Arizona	3,576
Delaware	3,087
Idaho	2,606
Nevada	1,828
Utah	1,633
New Mexico	770
	1,851,716

Percentage Gain in Registration

Dec. 31, 1921—Dec. 31, 1922

District of Columbia	38.4
Washington	31.2
Louisiana	27.0
California	25.1
Massachusetts	24.7
Arkansas	23.9
New Jersey	23.7
New York	23.2
North Carolina	22.8
Michigan	21.4
Rhode Island	21.0
Kentucky	21.0
Pennsylvania	20.3
West Virginia	20.1
Virginia	19.9
Florida	19.5
Ohio	19.5
Vermont	18.7
Maine	18.3
Indiana	17.9
Illinois	17.3
Mississippi	17.1
Nevada	16.9
Tennessee	16.0
Minnesota	15.8
Maryland	15.6
New Hampshire	15.2
Wyoming	15.1
Delaware	14.4
Oregon	13.7
Wisconsin	13.5
Connecticut	13.4
Missouri	13.1
Oklahoma	12.8
Texas	12.6
Kansas	12.3
Colorado	11.3
Arizona	10.2
Alabama	9.4
Georgia	9.3
Iowa	8.5
Nebraska	7.1
North Dakota	7.0
Montana	6.6
South Carolina	6.0
Idaho	5.1
South Dakota	5.0
Utah	3.4
New Mexico	3.1
	17.6

Registrations of Cars and Trucks

Dec. 31, 1922

New York	1,000,732
Ohio	861,000
California	842,663
Pennsylvania	829,737
Illinois	786,190
Michigan	578,980
Texas	526,670
Iowa	499,446
Massachusetts	449,838
Indiana	472,000
Missouri	391,669
Wisconsin	388,044
Minnesota	380,525
New Jersey	337,700
Kansas	327,185
Nebraska	256,654
Oklahoma	249,659
Washington	243,157
North Carolina	182,550
Virginia	169,000
Maryland	162,570
Colorado	162,170
Connecticut	156,000
Kentucky	152,870
Georgia	144,226
Tennessee	135,745
Oregon	134,566
South Dakota	125,233
Florida	117,000
West Virginia	112,752
Louisiana	102,284
North Dakota	99,100
South Carolina	95,978
Maine	91,710
Alabama	90,052
District of Columbia	85,425
Arkansas	83,583
Mississippi	76,300
Rhode Island	66,500
Montana	62,649
Idaho	53,900
Utah	49,156
New Hampshire	48,446
Vermont	43,881
Arizona	38,625
Wyoming	30,636
New Mexico	25,473
Delaware	24,500
Nevada	12,647
	12,357,376

mum value to the industry. No more necessary and useful sales analysis material could be procured than proper registration information. Its importance warrants a strenuous attempt to get it. The great need is for uniformity of registration practice. The particular form used is not so important, so long as every State uses it.

Motorcycle registrations will probably show a decrease again this year when the final figures are in. Some State departments are less prompt in compiling motorcycle results than in getting out the car and truck figures, so that ten States are still missing on the motorcycle list as this material goes to press. With those ten States missing, however, a total registration of 188,558 motorcycles is shown. Making liberal estimates for the missing States, this would be brought up to about 210,000 as compared with 207,000 last year. The high figure is obtained by recording moderate gains in each of the missing States. It is probable that there will be decreases in some of those States, however, so that motorcycle registration will probably do no more than hold even at the best.

Accepting the segregated truck and passenger car figures as correct in a general way, it is interesting to note that the proportion of the two types of vehicle varies greatly from State to State. The passenger cars outnumber the trucks by about 10 to 1 for the country as a whole,

but this ratio does not hold for each of the various States.

The percentage of passenger cars runs exceptionally high, for instance, in California and exceptionally low in New Jersey. In California the ratio of cars to trucks is about 21 to 1, while in New Jersey it is only about 3 to 1.

The great variation in the ratio is probably due to a number of factors, including climate, topography of country, character of predominant industries and character of motor vehicle tax laws.

Such variations must be thoroughly recognized when registration figures are being used in making specific market studies. The common assumption that trucks usually run about 10 per cent of passenger cars is not applicable to specific instances, and should not be applied in individual analyses. This point is emphasized because there is often a strong tendency to apply general averages to particular cases—a practice that almost invariably results in fallacious results.

Substantial Gains

The large registration gain recorded for 1922 was spread over the entire country. Fourteen States had increases of more than 20 per cent, while all but 12 gained more than 10 per cent. New Mexico had the smallest increase both numerically and proportionately. It just got over the top of the 1921 figure by 770, making its percentage increase 3.1 per cent. Nevada, on the other hand, was 23rd in the percentage gain list with 16.9, despite the fact that it stood third from the bottom of the numerical gain column with 1828.

Only 18 States have less than 100,000 cars and trucks registered. Last year 21 were under this mark. In 1921 only five States had a registration of more than 500,000, while the 1922 statistics show seven States in this high registration class.

Despite the high totals recorded, there are indications in some States that the figures do not represent the actual number of cars and trucks in use. Our correspondent from Arkansas, for example, writes:

"There is one point that I want to call to your mind and that is that licenses are issued for only about 85 per cent of the cars in the State. This is due to the fact that all license fees are collected by the sheriffs of the different counties, rather than by a centralized State department. Consequently there is considerable chance for dodging the payment of a tax."

It is true, of course, that some cars are registered in more than one State and duplications result in the registration figures in certain instances. Because of the variation in registration methods, it is impossible to make allowance for such duplications. They do not comprise any considerable proportion of the total, however, and are offset to some extent by conditions such as that described in Arkansas. Consequently, the total registration figure is very close to giving the actual number of motor vehicles in operation.

States registration methods are becoming better systematized each year, and we may expect registration data to become more accurate and useful every year. In Arkansas, for instance, it is expected that the present unsatisfactory situation will be remedied by the State Legislature which has just gone into session.

Motor Vehicle Registration 1912 to 1922

	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Alabama	3,385	5,435	8,078	11,925	21,636	32,873	46,171	58,898	74,637	82,343	90,052
Arizona	1,624	3,098	5,040	7,318	12,124	19,890	23,905	28,979	34,559	35,049	38,625
Arkansas	2,250	3,000	5,642	8,021	15,000	28,693	41,458	49,450	59,082	67,446	83,583
California	88,699	60,000	123,516	163,795	232,440	306,916	364,800	477,450	568,892	673,830	842,663
Colorado	8,950	13,135	17,756	27,568	43,296	66,850	83,630	104,865	128,951	145,739	162,170
Connecticut	24,101	27,189	33,009	43,985	61,855	85,724	92,605	109,651	119,134	137,526	156,000
Delaware	1,732	2,350	3,050	4,657	7,102	10,700	12,955	16,152	18,300	21,413	24,500
District of Columbia	1,732	2,373	4,833	8,009	13,118	15,493	30,490	35,400	9,712	61,745	85,425
Florida	1,749	2,372	3,368	10,850	20,718	27,000	54,186	55,400	73,914	97,837	117,000
Georgia	19,120	18,500	20,916	25,671	47,579	70,357	99,800	127,326	144,422	131,942	144,226
Idaho	2,500	2,173	3,346	7,071	12,999	24,731	32,289	42,220	50,873	51,294	53,900
Illinois	68,073	94,656	131,140	180,832	248,429	340,292	389,620	478,438	568,759	670,434	786,190
Indiana	54,334	47,000	66,400	96,915	139,317	192,192	227,160	277,255	332,707	400,342	472,000
Iowa	47,188	75,088	112,134	152,134	198,602	254,317	278,313	363,857	437,300	460,528	499,446
Kansas	22,000	34,366	49,374	72,520	112,122	159,343	189,163	227,752	265,396	291,309	327,185
Kentucky	5,147	7,210	11,746	19,500	31,700	47,416	65,870	90,641	112,685	126,371	152,870
Louisiana	7,000	7,200	12,000	11,380	17,000	28,394	40,000	51,000	66,000	80,500	102,284
Maine	7,743	10,570	15,700	21,545	30,972	41,499	40,372	53,425	62,907	77,527	91,710
Maryland	10,487	14,254	20,213	31,047	44,245	60,943	74,666	95,634	116,341	140,572	162,570
Massachusetts	50,132	62,660	77,246	102,633	136,809	174,274	193,497	247,183	304,631	360,732	449,838
Michigan	39,579	54,366	76,389	114,845	160,052	247,006	262,125	325,813	412,717	477,037	578,980
Minnesota	29,000	37,800	67,862	93,269	46,000	54,009	204,458	259,743	65,517	328,700	380,525
Mississippi	2,895	3,000	5,964	9,669	25,000	36,600	48,400	45,030	63,484	65,139	76,300
Missouri	24,379	38,140	54,468	76,462	103,587	147,528	188,040	244,363	296,919	346,437	391,669
Montana	2,000	5,686	10,172	14,499	24,440	42,696	51,037	59,325	60,646	58,785	62,649
Nebraska	33,861	25,617	40,929	59,140	100,534	148,101	175,409	192,000	223,000	238,704	256,654
Nevada	900	1,131	1,487	2,009	4,919	7,160	8,159	9,305	10,464	10,819	12,647
New Hampshire	5,764	7,420	9,571	13,499	17,508	22,267	24,817	31,625	34,680	42,039	48,446
New Jersey	43,056	48,892	60,247	78,232	104,341	134,964	155,519	190,873	227,737	272,994	337,700
New Mexico	911	1,721	2,945	5,100	8,228	8,457	15,000	18,077	22,109	24,703	25,473
New York	107,262	134,405	169,966	234,032	317,866	411,567	463,758	571,662	669,290	812,031	1,000,732
North Carolina	6,178	10,000	14,677	21,000	33,904	55,950	72,313	109,017	140,860	148,684	182,550
North Dakota	8,997	13,075	15,701	24,908	40,446	62,993	71,627	82,885	90,840	92,644	99,100
Ohio	63,066	86,054	122,504	181,332	252,431	346,772	412,775	511,031	615,397	720,632	861,000
Oklahoma	6,524	7,934	13,500	25,032	52,718	100,199	121,500	144,500	204,300	221,300	249,659
Oregon	10,165	13,957	16,447	23,585	33,917	48,632	63,324	83,332	103,790	118,325	134,566
Pennsylvania	59,357	76,178	112,854	160,137	230,578	325,153	394,186	482,117	570,164	689,589	829,737
Rhode Island	8,565	10,294	12,331	16,362	21,406	37,046	36,218	44,833	50,375	54,957	66,500
South Carolina	10,000	11,500	14,500	15,000	19,000	39,527	55,492	70,143	92,818	90,546	95,978
South Dakota	14,481	14,578	20,929	28,784	44,271	67,158	90,521	104,628	120,395	119,274	125,233
Tennessee	35,187	54,362	19,769	7,618	30,000	48,000	63,000	80,422	101,852	117,025	135,745
Texas	35,187	54,362	64,732	90,000	197,687	213,334	251,118	331,310	427,693	467,616	526,670
Utah	2,576	4,021	2,253	9,177	13,507	24,076	32,273	35,236	42,578	47,423	49,156
Vermont	4,283	5,918	8,256	11,499	15,671	20,369	22,655	26,807	31,625	36,965	43,881
Virginia	5,760	9,022	14,002	21,357	35,426	55,000	72,228	94,120	134,000	141,000	169,000
Washington	13,990	24,178	30,253	38,823	60,734	91,337	117,278	148,775	*173,920	185,359	243,157
West Virginia	5,349	5,088	6,159	13,279	20,571	31,300	38,750	50,203	78,862	93,894	112,752
Wisconsin	24,578	34,646	53,161	79,791	115,637	164,531	196,844	236,981	293,298	341,841	388,044
Wyoming	1,300	1,584	2,428	3,976	7,125	12,523	16,200	21,371	23,926	26,619	30,636
Totals	1,033,096	1,287,558	1,768,720	2,479,742	3,584,567	4,992,152	6,105,974	7,596,503	8,932,458	10,505,660	12,357,376

*Estimated.

Ways to Sell Motor Trucks

Editor, AUTOMOTIVE INDUSTRIES:

With regard to the close study that is being made just now on problems how to dispose of motor trucks to get the industry on its feet again, there are several things that occur to me which the truck manufacturers would do well to study.

In the first place, does it not seem rather foolish to have a truck sold to one grocer and a similar truck sold to another grocer a few blocks away, and a third and fourth and fifth truck sold to so many individual grocers?

Each one of those grocers has to maintain his repair man, his fueling and lubricating system, and in a grocery business a man has no time to look after such things efficiently.

The consequence is that the trucks get slighted and quite often a sale that should have gone through and been a forerunner of many other sales becomes an actual deterrent to such business.

I feel that something will be accomplished if future sales are directed largely to the question of forming large truck operating companies. I have on my mind a possibility of a large truck operating company renting out trucks on a commercial basis, such trucks having been furnished with sign boards or advertisements which the renter demands. These trucks can be housed in modern garages, surrounded by all proper mechanical conveniences and work can be supervised by high grade men. A truck will always be available for the renter, though it does not necessarily have to be the same truck as he had on the day previous, and it is then always neat and clean and carrying his sign. The monetary saving on operating trucks on this basis is considerable. The complete saving, due to the fact that the trucks are clean, well-kept, washed every night, etc., is one that cannot be estimated, but must also be very considerable.

This is one which can come better from the factory than the agent in the territory. It helps strengthen up fleet business which, of course, is a very big asset to the manufacturers.

This suggestion is given as a thought which may be of some benefit to friends of the truck industry.

JOHN YOUNGER, General Manager,
Standard Welding Co.

Standardized Gearshifts

Editor, AUTOMOTIVE INDUSTRIES:

I was very much pleased to see your editorial entitled "Standardize Gearshifts." It is a matter that has interested me many years and I trust that you will follow it up. It is hard to understand why some individual manufacturers should hold out against the standard shift, and still more strange that one large organization should build one car with standard shift and another with a shift all its own. I am sure that many minor accidents and occasionally serious ones occur from the lack of uniformity in gearshift, and the nuisance of it is most exasperating.

MARSHALL P. SLADE.

Finishing Cylinder Bores at Working Temperature

Editor, AUTOMOTIVE INDUSTRIES:

In the Dec. 7 issue, page 1121, reference is made to a new type of cylinder boring machine, and it is stated that some coolant is used, "in order to keep the cylinder at a substantially constant temperature throughout the boring operation."

Many years ago I had to do with the machining of an Oldsmobile single cylinder design, the walls of which were finished in three operations (without grinding). I found that the first rougher caused the bore to heat most at the open end and less at the square flange 4 in. up, and at the junction of the jacket. The same was true as to the last transfer. From that point to the end of the bore (there being a plain wall) the conditions again changed. Even after the first cut was finished the extreme corners of the square flange and jacket had not accumulated any heat from the hot bore, the time period being too short. To attempt to put another cut through and then ream for a finish with such a condition did not seem reasonable to me.

My solution was to use a revolving fixture, mounted on a Beman & Smith double spindle mill, holding four pairs of cylinders with one pair being bored. When this was done the first pair went around the circuit while the other three pairs were being rough bored. This procedure caused the heat to be distributed so that when the boring tools were changed for a second cut there was no perceptible variation in temperature. It is safe to assume that the second cut did not heat the bore abnormally and any tendency to do so was again overcome by the circuit period. The reamers then started at an equalized bore temperature. As a further means to make conditions ideal, the first rougher was provided with four tools and the second with six, while the reamers had eight blades. This eliminated any possibility of one tool taking up the chatter of the one that preceded it.

I might say that the cylinder came off the machine too hot to be held long with the bare hands, and I believe they were finished at or near the working temperature of the cylinder under power. That is the point I wish to make, and it is worthy of thought. Annealing, seasoning and time periods between operation are all very well, but how a block cylinder tied at the bore with flanges and ribs, and ground to a finish, can be expected to be true when cold is a thing I cannot understand. Perhaps some of the wise ones will explain this theory away. I believe my 1904 procedure has virtue; it at least produced results when cylinder grinders were not available.

JAMES MCINTOSH.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE
Reg. U. S. Pat. Off.

PUBLISHED WEEKLY

Vol. XLVIII Thursday, January 11, 1923 No. 2

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
David Beecroft, Directing Editor
U. P. C. Building, 239 West 39th Street, New York City

BUSINESS DEPARTMENT
Harry Tipper, Manager

EDITORIAL
James Dalton, Editor
Norman G. Shidle, Managing Editor
P. M. Heldt, Engineering Editor
Herbert Chase, Engineering Editor

DETROIT OFFICE
J. Edward Schipper

WASHINGTON OFFICE
26 Jackson Place, N. W.

BRANCH OFFICES
Chicago—Mallers Bldg., 59 East Madison St., Phone Randolph 6960
Detroit—317 Fort Street, West, Phone Main 1351
Cleveland—538-540 Guardian Bldg., Phone Main 6432
Philadelphia—1420-1422 Widener Bldg., Phone Locust 5189
Boston—185 Devonshire Street, Phone Congress 4336
Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

Cable Address.....Autoland, New York
Long Distance Telephone.....PENnsylvania 0080, New York

United States and Mexico.....One Year, $3.00
Extra postage west of the Mississippi River on account of Zone Postage Law 0.50
Canada .....One Year, 5.00
Foreign Countries .....One Year, 6.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order or Register your letter.

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.
Entered as second-class matter Jan. 2, 1903, at the post-office at New York, New York, under the Act of March 3, 1879.
Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.
Automotive Industries—The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly) July, 1907.

The Problem of Legislation

AN indication of the general attitude of State administrations and legislatures toward motor vehicle taxation is found in the inaugural address of Governor Smith of New York.

"It has not been demonstrated to my satisfaction," he said, "that highways should be built from the proceeds of bond issues. In any circumstances they are of so temporary a nature that the cost of building and maintaining them should be met from the current revenues of the State."

In respect to highway accidents, he said:

"It is clear that we must attack the problem of highway accidents immediately and in a comprehensive way. The toll of lives which the motor vehicle is taking is each year becoming greater."

Governor Smith's attitude toward motor vehicles naturally is much more sympathetic than that of most governors, for he was president of the largest trucking company in the country until he resigned just before taking office. He knows the problem of the truck from the viewpoint of the operator and yet he feels that something drastic must be done to cut down the number of accidents.

It is high time the automotive interests agreed upon some program of legislation which will be fair to the public and which will mark distinct progress in this nighly necessary work while at the same time protecting their own rights so far as justice permits.

More Railroad Patent Medicine

SOLUTION of the reparations problem, the soldiers' bonus and payment of "real wages" to every workman in the United States, are comparatively simple after all. Those persons in high places who have pondered painfully over these problems without finding the right answer are merely dumb-bells.

Page Mr. Albert Farwell Bemis, who has written a piece for the New York *Journal of Commerce*. His parents may have had a prophetic vision when they gave him his middle name. At any rate, he knows what's the matter with America.

It's afflicted with too many "pleasure" automobiles.

Mr. Bemis has discovered the panacea. All Congress has to do is to sign the prescription. It may be possible to dilute traffic with one and one-half per cent of these dastardly vehicles, but the rest must go.

Our hero has compiled figures and everything. Figures don't lie—except when they're juggled.

"The sum total of this absolute criminal waste," Mr. Bemis says, "may well exceed $5,000,000,000 annually."

Think of that and then think of this: "If our national annual expenditures of $5,000,000,000 for pleasure motoring were diverted to other channels" it might solve our housing problem, make possible cancellation of the allied war debt to us, pay the proposed soldiers' bonus in one year or make possible the payment of real wages throughout the country.

We almost forgot to say that Mr. Bemis also bewails "the extravagant waste of national and State funds in the building of highways for motor use paralleling our rail lines when railway feeders and not competitors are what sound economic development requires."

It's the same brand of patent medicine bunk the railroads have been peddling so long, and not a panacea at all.

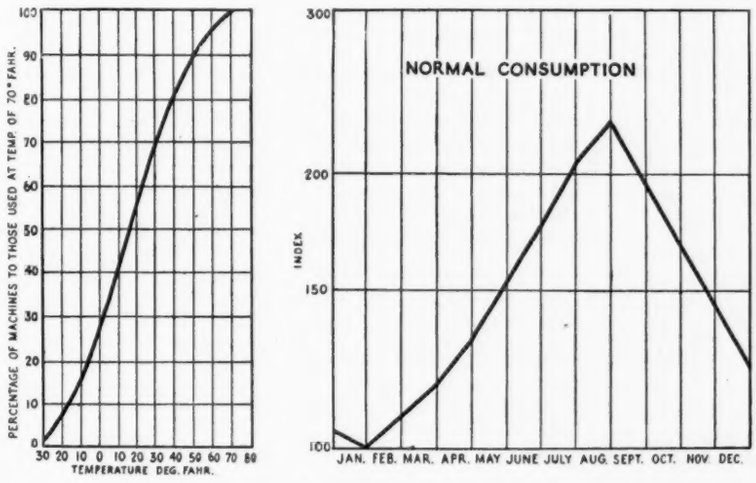
Progress in Highway Research

THE industry is to be congratulated upon the fact that a definite program of highway engineering research has been agreed upon. There is a sad lack of accurate data upon which to proceed. Committees representing manufacturers, automotive and highway engineers, and the Bureau of Public Roads now have settled upon the work each will undertake in 1923 and distinct progress can be expected. Highways of the future must be built upon the basis of scientific knowledge.

Ways To Make Cars All-Season Vehicles

YEAR around cars have long been talked about in the industry and some effort has been expended to make better all-season vehicles. There is still much to be done in this direction. The less expensive closed body will help and is deserving of all the attention it is receiving for this if for no other reason. But even the universal use of closed cars will not bring about all year service. Many of such cars are laid up or seldom used in winter and there is still a marked seasonal decline not only in car sales but in the sales of fuel, supplies, service and other items which, if they could be kept more nearly uniform in quantity distribution throughout the year would work great benefits to all concerned.

If anyone is inclined to doubt that there is a great difference as between the summer and winter months in respect to the use of automotive vehicles it is necessary only to refer to the record of normal seasonal consumption of gasoline, since the total daily mileage of all motor vehicles is almost exactly proportional to the fuel consumed. Such a record is given in an accompanying cut. It shows that the fuel consumed in August is more than double that used in January. Over 60 per cent of the year's consumption occurs between May 1 and Oct. 31, showing that 50 per cent more total vehicle miles are run in the warm than in the cold months of the year. This naturally involves corresponding variations in the business of the industry taken as a whole.



Curve at left shows how change of temperature affected use of cars at one automotive plant. (Right) Seasonal variation in consumption of gasoline

Probably even the "perfect" automobile would not be used quite so extensively in winter as in summer. It is possible, however, to lessen the difference between summer and winter use, and the consequent difference in sales of cars, parts and supplies, both by improving the vehicle and by bettering some conditions which largely control its use.

Among the items which should be given attention so far as car performance in cold weather is concerned are:

1. Bodies fitted with heaters and designed to afford better protection from the elements.
2. Engines and other equipment which renders starting more certain and shortens the warming up period.
3. Tires which are less liable to injury or deflation and which afford better traction and less likelihood of skidding no matter what road condition is encountered.
4. Cooling systems or mediums which cannot freeze and which are easily maintained at a temperature such as to insure highest operating efficiency.
5. Means for keeping he car in operative condition with minimum attention on the part of the user.
6. Greater general dependability and freedom from road troubles.

Factors which are largely outside the control of the industry but which can be influenced by it in the interest of wider use of motor vehicles in the winter include:

1. Construction of roads which are least affected by weather conditions.
2. Provision for keeping all roads open in the winter.
3. Arrangements whereby fuels which give less trouble than present fuels are marketed, particularly in cold weather.

Several of these items have already been given consideration by progressive manufacturers who see the desirability of bettering the performance of their product under all conditions of use. A more general and intensive consideration will not only improve the product but will have a highly desirable effect in helping toward the elimination of valleys in the year's production curve.

How marked an influence changes in temperature have upon the use of cars even for business purposes is illustrated by a second but less general graphical record showing the change in percentage of cars used by employees in the Waukesha Motor Co. plant with variation in temperature. These cars were owned by workmen who used them for going back and forth to work. At the plant they were stored in an open shed. A majority were Fords without starters.

As will be seen by reference to the curve the number of cars driven to the plant when the outside air temperature was at 70 deg. Fahr. is taken as 100 per cent. When the temperature fell to the freezing point less than 70 per cent of the cars were used. At zero deg. Fahr. only 25 per cent were used.

The average temperature at points in the United States north of a parallel drawn through St. Louis—an area containing about 75 per cent of the motor vehicles registered in this country—is said to be below 50 deg. Fahr. Even at this temperature, according to the curve here given, 10 per cent of the cars used at 70 deg. Fahr. are not in operation.

It is not contended that the curve given is typical or representative of conditions which prevail in all localities but it is quite evident that temperature does have a decided effect upon the extent to which passenger cars, at least, are employed.

Year's Output Reached 2,576,000

Production in 1920 Exceeded by 370,803

Industry Completes 1922 by Producing 225,000 Cars and Trucks in December

OUTPUT SINCE 1899

Year	Output	Year	Output
1922.....	2,576,000	1911.....	210,000
1921.....	1,668,550	1910.....	187,000
1920.....	2,205,197	1909.....	127,731
1919.....	1,974,016	1908.....	65,000
1918.....	1,153,637	1907.....	44,000
1917.....	1,868,947	1906.....	34,000
1916.....	1,583,617	1905.....	25,000
1915.....	892,618	1904.....	21,975
1914.....	569,045	1903.....	11,000
1913.....	485,000	1899.....	3,700
1912.....	378,000		

NEW YORK, Jan. 9—With a production of 225,000 cars and trucks in December, the year just ended reached the record-breaking total of 2,576,000, exceeding by 55 per cent the count in 1921 and surpassing the previous high-water mark of 2,205,197 established in 1920.

The figures which were produced at the directors' meeting of the National Automobile Chamber of Commerce by James S. Marvin, head of the traffic department, surpassed the estimate of 2,527,000 made by the statisticians a few weeks ago.

Despite the annual inventory-taking period, car manufacturers put on all the steam possible during December so that the month established a new record and fell behind November, 1922, only 5 per cent.

Marvin's report shows that carload shipments in December aggregated 26,900 as compared with 27,232 in November, and driveaways, 27,500 as against 27,376.

(*Table of shipments on page* 101)

Court Scores Standard Parts Bank Creditors

CLEVELAND, Jan. 8—Attorneys for the stockholders of the Standard Parts Co. have asked Federal Judge D. C. Westenhaver to postpone for 10 days a hearing on the application of Receiver Frank A. Scott to sell the properties of the corporation. Plans were under way to sell all of the plants the latter part of this month.

The court criticized the large bank creditors for their action in insisting that the properties be sold and scored the stockholders for their inactivity.

Attorney Harry J. Crawford, representing the common and preferred stockholders, appeared before Judge Westenhaver on the date originally set for the hearing and informed the court that the stockholders were engaged on a reorganization. He refused to state just what was contemplated as the plans were formative only.

H. P. McIntosh, chairman of the Guardian Savings & Trust Co., stated that new details had been added to the first plan that was devised.

Business in Brief

NEW YORK, Jan. 11—The holiday season rush over, industry enters upon a normally active winter period. Wholesale trade is quiet, but enough orders are on the books to keep activity more assured than at any similar time in the previous two years.

Great activity is being experienced in the iron and steel industries. Railroads, automobile and implement manufacturers are buying heavily. Railroad car orders for 1922 totaled nearly 200,000, or eight times more than in 1921.

Soft coal production for the year just ended exceeded that of 1921, but anthracite fell some 40 per cent behind. Reports state that soft coal prices are firmer in the East, but easier in the West. Threats of another strike in April appear in spite of conciliatory efforts.

Car shortages still persist. Grain marketing and shipments of coal and lumber are hampered.

Building materials are more than usually active for this season. Lumber sales on the Pacific Coast have been augmented by the demand for new freight cars.

Movement of grains declined and prices fell off this week. Wheat and cotton reflect an over-the-year-end liquidation after great advances. All grain exports have increased materially.

The week's stock market was very irregular. Bonds were firm and fairly active. New offerings were well absorbed. Bank clearings for the week ending Jan. 4 aggregated $8,229,081,000, a 36.2 per cent gain over the previous week.

January Promising New Output Record

Companies Are Operating on Schedules Far Above Same Month of Last Year

NEW YORK, Jan. 8—The industry has entered the New Year at a pace greater than that followed in December and much quicker than was maintained a year ago. The end of the inventory period found many plants with back orders unfilled and a sufficient current demand to warrant operations at an exceptionally high level. This level is not equal to the peak months of last year but it is so far above January of 1922 as to promise a new record for the month.

Production schedules for the year have been mapped out by many producers and the end of the New York automobile show, upon which the attention of the industry is centered this week, will find few manufacturers without a definite or tentative schedule settled upon for this year's operations. The major companies will have their plans pretty well defined. Marked stimulus to buying interest is expected as the natural result of the display of new models which show refinements in design as well as engineering improvements.

Worked Through December

December, usually one of the slack months of the year inasmuch as it is broken into by the stock taking period, will show in its final production figures a far less effect from the interruption of activities than in previous years. This is due largely to the fact that few of the larger producing plants closed down entirely for inventory.

The first three weeks of the month averaged well up to November, a decline coming only in the last week. It is not at all unlikely that the output for the month will aggregate 200,000, at least, which will bring the year's total beyond the anticipated 2,500,000 mark.

Some improvement is noted in the body situation. While conditions are not normal a marked improvement is apparent over the early part of the season when car production was con-

(*Continued on page* 101)

Durant Adds Another Car to Line

Prices Are Higher Than of "Six" Model

W. R. Willett Is Placed in Charge of Its Manufacture at Muncie Factory

NEW YORK, Jan. 9—The "Princeton," ranging in price from $2 485 to $3,675, was announced to-day by Durant Motors, and models of the new line were placed on exhibition in the retail sales room of the Lexington in the Fisk Building.

The "Princeton" will be made by the Durant Motor Co. of Indiana in the Muncie plant, where the Durant Six is being manufactured. The new car will be an addition to the Durant line. It is new from radiator to rear wheels and is in an entirely new price class from the Durant Six. which lists at $1,650.

W. R. Willett, who is president of the Durant Motor Co. of Indiana and who for the last six months has been developing the new job, will be the directing spirit in this new unit. He expects the car to be in production by April. An entirely new sales staff will be built up to sell the line. Willett has been with Durant for twenty years, at one time being head of the Rainier division, then a part of General Motors. Later he acted as manager of the Welch Motor Co. at Pontiac, another G. M. C. division and from 1913 to 1916, served as works manager of the Gemmer Manufacturing Co. of Detroit. In 1919 he organized the Central Gear Co. and Central Axle Co. for General Motors. After that he rejoined Durant.

Six Models Included

The line will include six models as follows: Seven-passenger sedan, $3,675; seven-passenger sedan-limousine, $3,550; five-passenger coupe, $3,350; four-passenger sport phaeton, $2,585; seven-passenger phaeton, $2,485 and three passenger sport roadster, $2,485.

There will be two chassis, five of the models being on the one with 128 in. wheelbase and the other, the seven-passenger sedan limousine on the one of 132 in. The engine will be a special built Ansted six, while the other units will include the Durant clutch, Warner steering gear and transmission, Durant axles, Fedders radiator and Spicer universal joints.

Canada Will Offer Good Field for Sale of Automobiles Due to Improvement in Agricultural Conditions

By WALLACE R. CAMPBELL,
Vice-President of the Ford Motor Co. of Canada, Ltd.

Detroit, January 8.

DURING the past year Canada has made history in the matter of motor car registrations in that the country now has in excess of half a million cars in use. As a matter of fact, as nearly as statistics can be obtained at the moment, it appears that there are approximately 525,000 cars in use in Canada, making this country the third largest user of automobiles in the world, exceeded only by the United States and Great Britain. Canada comes second in cars per capita, having approximately one car for every 18 people, or approximately a car for every four families.

It would be safe to assume that last year 70,000 cars were sold in Canada, which would mean, at an average price of $1,500, a total business of roughly $100,000,000. In view of the fact that general business conditions have been gradually improving during the past year, it should also be assumed that a larger volume of business is in sight. All statistics seem to point to this condition. The crops recently harvested have been the greatest since the bumper yield of 1915, and while wheat at $1 a bushel does not give a great margin of profit, nevertheless there has been a profit and the result of the sale of all crops shows an increase of about 25 per cent over the year 1921, or something in excess of $200,000,000 more money.

Inasmuch as Canada is largely an agricultural country, her buying power must depend to a great extent on the annual returns from crops, so that it is reasonable to assume that the buying power for the coming year should be considerably greater than during the past year. Business has been below normal since the fall of 1920 and is still far from normal, and in all probability it will be two years before the effects of business depression will be entirely overcome, but in the meantime steady improvement should be evidenced provided general business is carried on along safe and sane lines.

There are many indications that these lines are being followed as evidenced by the fact that Canada experienced a favorable trade balance for the half year ending in October of something in excess of $60,000,000 as against an adverse foreign trade balance of $125,000,000 during the year 1921 and $140,000,000 during the calendar year 1920. In this connection it is gratifying to note that our exchange has returned to approximately par.

The figures cited above showing the use of motor cars per capita in Canada indicate very clearly that motor cars have become practically a household necessity in this country. Distances in Canada, however, are very great and the future of the industry is tied up to large extent with the building of good roads throughout the entire Dominion. It is pleasing to note that very great strides have been made in this direction by reason of cooperation between the Dominion government and the various Provincial governments.

B & B HEAT INDICATOR SOLD

NEW YORK, Jan. 8—The Pyrene Manufacturing Co. of Newark, N. J., has purchased all the patents, stock, etc., of the Borg & Beck Heat Indicator Co., formerly made by Borg & Beck of Moline, Ill. In all probability the device will be made by the Newark concern, but most likely under a different name. In addition, this company also has the Guardian, a warning signal that fits on the radiator, while the Borg & Beck device is a dial instrument.

IRVIN R. BAILEY DIES

AKRON, Jan. 9—Irvin R. Bailey, vice-president and sales manager of the Seiberling Rubber Co. and one of the best known men in the tire industry, died here today of apoplexy. He was stricken New Year's Day. Bailey resigned as assistant sales manager of the Goodyear Tire & Rubber Co. in 1921 to join the new Seiberling company. He formerly was identified with old Diamond Tire Co.

United Motors Branches Now Employing Flat Rate

DETROIT, Jan. 9—The adaptation of the principles of the flat rate repair system to electrical service has been completed by United Motors Service, which has put into operation in its twenty-one branches a flat rate repair schedule. This covers maintenance repair operation on Delco, Klaxon and Remy equipment.

The same schedules are in effect at all of the direct branches of the United Motors Service in the United States and the system is now operated so that maintenance repair at the rates established is available at these branches to any car owner as well as to the trade in general.

Industrial Sections Will Buy Most Cars

Sales Heads, However, See Improvement in Conditions in Farm Districts

NEW YORK, Jan. 6—General feeling among sales executives at the show was that the largest market for automobiles generally through the year will continue to be in the industrial sections of the country and from the Pacific Coast. There will be a general improvement in buying from farm districts, the South being regarded as somewhat more favorable in this respect than the wheat or corn districts.

In the industrial sections, business conditions are expected to continue along the same general lines as last year, except that improvement is looked for in the districts afflicted by strike conditions last year, notably the coal and steel producing centers. The forecast of the industry does not take into consideration the possibilities of a recurrence of industrial disturbance in these sections.

Field in New England

New England industrial districts are regarded in the industry as behind in their automobile requirements due to industrial stagnation in the past year and, with freedom from disturbances, are regarded as presenting a large market for cars of all descriptions and price classes. In the industrial Central West conditions are regarded as almost ideal for large automobile business in all classes of cars.

In the South the cotton and tobacco States have had a successful season and are getting high prices for good crops. Except for Virginia and South Carolina business in that part of the country is regarded as good, with automobile sales already coming through in large volume. In South Carolina the boll weevil has raised the usual amount of havoc, and its inroads will keep that State from the prosperity its sister States are enjoying.

South for Low Priced Car

Like the Middle West, however, the South generally is regarded as principally a low priced car territory for another crop season, though the cities and centers present openings for the sale of both middle priced and high priced lines. In Texas and Oklahoma the oil fields are at the peak of operations, with general business good and a steady demand for cars in all classes.

Fruit growers in the Southwest were hard hit by the failure of transportation for their crops and are temporarily out of the market, but are ready to stage a comeback. The sugar beet crop has been good, and growers in the Southwest are prosperous and ready to buy cars in all classes. Cattle raisers are becoming better fixed financially than they have been and are regarded as ready to enter the car market. Their purchases will take in cars of all price classes.

General business conditions along the Pacific Coast make for good business in all car classes, with medium priced and better priced cars making a better showing than in any other section of the country. In the Northwest, the lumber trade is sold months and months ahead of deliveries. Large buying in all car classes is already strongly under way.

Hundreds of cars in the low priced and medium priced field are being shipped into the northwest section east of the Rockies in anticipation of large spring buying, a buying which will only be a continuance of the business which was going forward previous to the onset of winter.

3 WINDOWS DISCLOSE GOOD ROADS AT SHOW

NEW YORK, Jan. 8—One of the most interesting exhibits in the show is that of the Bureau of Public Roads, which displays "Three Windows on the Road." The windows disclose miniature models of a suburban community, a country hamlet and a farm, showing the good roads by which they are served, together with motor vehicles of all types.

In the country village, for example, there is a Union school in front of which stands a motor bus which carries the children back and forth, and a library which is the center of the community activity. The models are artistically made in colors. In front of the different windows are brief descriptions of the purpose of the display. They read:

"Escape from the crowded city for the worker in mill and office. A chance to live in the suburbs and play in the country."

"Every crossroads village a spiritual, educational, cultural and commercial center of a better country life."

"A cheaper, quicker haul to market—a better chance for the farmer and better food for the city dweller."

REO EXTENDS LABORATORIES

DETROIT, Jan. 8—Reo Motor Car Co. has started operations on an extension to its engineering laboratories at the Lansing plant. The building will give the company necessary space for its research and experimental work.

HANDLEY SCHEDULE OUTLINED

NEW YORK, Jan. 8—James I. Handley, president of Handley Motors, Inc., states that production on the new line of cars will start about April and that the schedule at the beginning of operations will be limited to ten or twelve cars a day.

Low Price Car Maker Looking to Farmer

Agriculturist Will Be Guided Entirely by Considerations of Economy

NEW YORK, Jan. 6—Whether the farmer is to be a large buyer of cars in 1923 seems to be a matter entirely of car size and price. Manufacturers of low priced cars are looking to the farm market to present a large if not the largest part of their business during the year. In the middle and higher priced fields, manufacturers are looking for good business in the farm centers, but in the main are inclined to relegate the farm field almost entirely to the low priced maker.

"The farmer buys on prospects and sells on crops," said one of the most prominent men in the industry at the show, "and with good crops and fair prices in prospect he is likely to be a good buyer this year." The big field of business, however, he said, will be in the industrial sections of the country, with farmer buying generally serving to stimulate business activity in these sections. This was a medium priced car opinion.

Prospect for Trade Varies

From the low priced car angle, the prospect for business is widely different. Farmers are declared to be already in the market on a large scale in sections where weather conditions permit car operation. Business in the southern farming districts was declared brisk now and cars are moving in as large quantity as they can be sent forward. Immediate business farther west is handicapped by weather, but promises big returns starting in the spring, according to present indications.

In his buying of cars this year it is generally conceded that the farmer will be guided entirely by considerations of economy, and for that reason will buy the low priced cars. In thousands of these cases there is a desire for higher priced cars, manufacturers believe, but the farmer will be compelled to sacrifice his ambitions temporarily while getting his affairs in more satisfactory condition. That another year will see him an important factor in the middle priced field is regarded as certain.

Middle Priced Field in 1924

There are quite a number of small middle priced car makers located in smaller industrial centers who declare they will do larger business among the farmers in their plant vicinities than they have for several years. The big middle priced car builders look for larger farm business than in recent years, but do not expect anything like full development of this field for cars in their class for another year, or late this year at best.

Bank Not Unfriendly to Sound Company

Financial Condition of Producer Important in Getting Aid for Dealers

NEW YORK, Jan. 6—"The banker always has been willing and is willing today to entertain good accounts, no matter whether in or out of the automotive industry." This was the way in which one of the leading sales executives of the industry sized up the banker angle of the present day automotive situation, and this depression appeared to represent the general opinion of executives at the show.

The financial condition of the manufacturing company has an important place in the consideration of the banker when a dealer makes application for credit, an importance which in many cases determines whether the accommodation is extended or not. Where a dealer is unable to get credit with one line and is a fairly reliable dealer, the certainty is that he will turn to another line with which his business needs will be met.

Statements Help Dealers.

In this connection factory officials emphasized the necessity of playing up the financial strength of the producing company as an inducement to bankers to be less wary in their relations with dealers. Frequent financial statements to which wide publicity should be given were offered as a means of doing this, and it was pointed out that many companies have made conditions much better for their dealers in this way.

The financial strength of the dealer is not sufficient recommendation to the banker, but is only incidental to the financial strength of the manufacturing company he represents. Where there is a combination of reliability of both dealer and parent company the banker is ready and anxious to do business. The banker who fails to participate in the possibilities of a good automobile business backed by these conditions, is a poor business man, officials say.

Used Cars Will Figure

The day is coming shortly when bankers will insist upon their dealer accounts providing specifically for the amount of money which may be tied up in used cars at any one time. Too much risk has been engendered by the carrying of large stocks of cars, the market for which is regarded as uncertain at best, and in which large losses are likely to be involved. Where dealers accumulate a stock of cars, the bankers will step in and withhold credit until the stocks are depleted or brought to reasonable figures.

On the whole the industry regards the banker as being friendly disposed at this time, particularly with the prospects of a good year's business. In most parts of the country there is a plentiful supply of money, and deposits in banks are reported to be much higher proportionately than in the past two years. Liquidation of cotton looms, and farm credits in the South and West respectively have brought about a change in the bank attitude in those sections.

USES RAILWAY PLANT FOR CAR BODY WORK

SPRINGFIELD, MASS., Jan. 8—The Wason Manufacturing Co. plant of the J. G. Brill Co., formerly devoted exclusively to the manufacture of cars for street railways, is being diverted to automobile body work to a large extent. This plant has a contract to do woodwork and painting for the Auto Metal Body Co. of this city, whose plant is inadequate to take care of its orders.

Pierce-Arrow Seeking Return of Export Tax

BUFFALO, Jan. 8—The Pierce-Arrow Motor Car Co. has filed suit against Vincent H. Riordan, former collector of internal revenue, demanding the return of $141,432, paid in taxes on exported automobiles. Costs of the action and interest on the taxes paid from July, 1920, also are asked.

The complaint contends that the company was "erroneously and illegally" assessed. The automobiles were sent to Japan, France, Canada and Cuba during 1917. The company claims that the taxes should not have been assessed on the cars as articles of export to a foreign country.

The case of LaFrance Engine Co. of Elmira, which is suing the Government for the return of $214,000 paid in taxes, has begun before Judge Hazel in Federal Court. The LaFrance company claims that fire engines should not be considered as passenger cars, but should be taxed under the head of commercial vehicles. Firemen riding on the engines are not to be considered as passengers, according to the plaintiff.

American Bosch Reports Improvement in Demand

SPRINGFIELD, MASS., Jan. 8—Prospects for the American Bosch Magneto Corp. in 1923 are excellent, President Arthur T. Murray said today. He forecasts production for the year at from $10,000,000 to $12,000,000 at the plant here and at $5,000,000 to $7,000,000 at the Gray & Davis factory in Cambridge.

The demand for magnetos has shown a marked improvement in the last few months, he says, the agricultural revival having stimulated the market for tractors, trucks and stationary engines using magnetos. About 1600 men are employed now at the Bosch plant, which is more than double the number working there a year ago.

Companies Improve Financial Position

Shifts from Surplus to Capital Account Will Permit Plant Improvement

DETROIT, Jan. 7—Transferal of millions of dollars from surplus to capital account by many industrial companies during 1922, among which are listed many automobile manufacturing companies, will result in large expenditures for plant and equipment improvement, in the opinion of executives here, and as such will have a pronounced influence in improving general business conditions during the year.

Automobile companies are taking advantage of improved financial positions due to such transferals to bring their plants and equipment to the highest point of perfection. Much of this work is being done quietly in expectancy of largely increased production due to new machinery installation, and before the new selling season is opened these factories will be in position to make marked increases in former records.

Greater Earning Capacity

With newer and more modern type machinery making for greater production and consequently lowered manufacturing costs, the earning capacity of these companies will be greatly increased.

The improvement of plans and equipment is not limited to those companies which have transferred funds to capital account by stock dividends, but is more marked in their cases, particularly with respect to plant equipment. Practically all of the larger plants are making additions to their factories and millions of dollars will be spent by the industry as a whole in preparation for increased production this year and in the future.

There are evidences everywhere, executives declare, of similar action being taken by companies in all forms of industry.

Creditors of Premier Hear of Monroe Plan

INDIANAPOLIS, Jan. 8—Judge Hay of the Superior Court of this city has postponed the sale of the Premier Motor Corp. to Jan. 19.

A plan of the reorganization committee would merge the assets of the Premier and Monroe companies, and a letter to Premier creditors has gone out this week making tentative announcement of such a move.

It is understood that the court's action in further delaying the proposed sale was to give the reorganization committee time to work out their plans. Whether or not the outside capital reported to be interested in bidding for Premier is also interested in the Monroe-Premier plan cannot be ascertained.

Rubber Makers Name De Lisser New Head

Rutherford and Stadleman Are Moved Up as Result of Yearly Election

NEW YORK, Jan. 8—Horace De Lisser, chairman of the board of directors of the Ajax Rubber Co., was elected president of the Rubber Association of America at the meeting of the new directorate.

W. O. Rutherford, vice-president of the B. F. Goodrich Co., was named to fill De Lisser's old position as first vice-president, while the second vice-presidency, left vacant by Rutherford, is taken by G. M. Stadleman of the Goodyear Tire & Rubber Co., a member of last year's board. A. I. Viles continues as secretary and general manager.

George B. Dryden of the Dryden Rubber Co. of Chicago, H. Stuart Hotchkiss of the United States Rubber Co. and W. O. Rutherford of Goodrich were re-elected to the board, while two new directors were chosen in W. E. Bruyn of L. Littlejohn & Co. and C. E. Stokes of the Howe Rubber Co. of Trenton, N. J.

The association's annual banquet was held at the Waldorf-Astoria Hotel tonight, the chief speakers being Senator Pat Harrison of Mississippi, who talked on the European situation, and Senator George H. Moses of New Hampshire, who spoke on taxation. Senator Moses declared that the present tax system is the "most vicious system of public taxation ever inflicted on a people."

Harding Sends Message

President Warren G. Harding sent a message in which he said:

I suppose it would be difficult to name another great industry that has suffered so severe a deflation following the war boom. That experience was doubtless unavoidable and came to many other industries and interests. I have been impressed that the men who have dominated the rubber industry have peculiarly deserved, by reason of their courage, their steadfastness and determination, a great deal of credit in connection with the rapid resumption of prosperity in their department of industry.

I have often thought that the story of rubber in the last decade is one of the romances of the modern industrial world. Very much of its interest, of its importance, as a lesson in industrial organization and development is due to the fact that it has so successfully adapted itself to the widely varying and extremely difficult business propositions. The men who have been leaders in this industry have given the industrial world an example that I wish were better known and understood. If it were possible for me to do so I would greatly delight to accept your invitation and indulge some impressions of my own along this line.

ROLLS-ROYCE EXPANDING

SPRINGFIELD, MASS.. Jan. 8 — Rolls-Royce of America, Inc., has enlarged its coach works by occupying 46,000 sq. ft. of floor space in addition to the six-story building it has used for this division. This extra space is on four floors and will be used to provide more room for the painting, erection and upholstering of bodies.

The expansion will assure full coordination between chassis and body production and serve to increase production and speed deliveries of finished cars. Operations have increased continuously for many months, and more especially since the company's coach works were established as an integral part of its factory plant.

OUTLOOK PLEASING TO PARTS MAKERS

NEW YORK, Jan. 10—Parts manufacturers who are here in large numbers to attend the show are highly gratified over the business outlook for the first half of the year. Commitments already on their books indicate that vehicle manufacturers expect sales to continue for some time on the present basis.

Many parts makers had the biggest volume of business in their history last year, although other years have shown greater profits. Collections are fairly satisfactory, although not quite so good as a few months ago.

Boston Revises Basis For Figuring Trade-In

BOSTON, Jan. 10—The Boston Used Car Statistical Bureau has revised the basis of figuring allowance prices as follows:

Current models from one day to three months old valued at 75 per cent of list price; three to six months old, 68 per cent, and six to twelve months old, 65 per cent.

Valuations of older models have been fixed as follows:

1922, 58 per cent of current list
1921, 40 per cent of current list
1920, 30 per cent of current list
1919, 20 per cent of current list
1918, 15 per cent of current list

A survey of used cars in the hands of New England dealers, Jan. 1, showed 14,492 used cars in the stocks of 1335 dealers, or an average of 10.8 cars per dealer. In Boston the average of dealers reporting was 31, in Rhode Island 14, in Massachusetts, outside of Boston, 11, in Connecticut 10, New Hampshire 9, Maine 8 and Vermont 7.

FIRE AT WILSON FOUNDRY

PONTIAC, MICH., Jan. 8—An explosion of gasoline in the storage house and tunnel system of the Wilson Foundry & Machine Co. today wrecked the storage house, damaged the boiler room of the Michigan Drop Forge Co. and did damage, which, it is believed, may reach a total of $50,000.

National Will Make All Its Own Parts

Former Associated Motors Makes Plans for Using Factories of Members

NEW YORK, Jan. 5—T. C. Brandle, vice president in charge of merchandising of National Motors Corp., formerly Associated Motor Industries, Inc., states that it will be the policy of the company to manufacture practically all the parts entering into the three six-cylinder chassis which constitute the National line, although some parts and equipment will be purchased until such time as the various plants of the company are organized for production.

Examples of equipment to be made at once within the organization are the gearset, axles, clutch and steering gear used in the new light six. These will be manufactured at the Covert plant of the National Motors Corp.

Brandle says further that the Recording & Computing Machine Co. plant in Dayton, owned by National Motors, will manufacture starting, lighting and ignition equipment primarily for use on National cars, but also for general sale to the trade. This equipment already has been developed under the name of "Ohmer" and is said to be ready for quantity production.

It is the plan of National Motors to sell its cars through distributors and dealers throughout the country. Brandle stated that within a year assembly plants will be established in Oakland, Cal., and also at some point in the east yet to be selected, while a general warehousing plant may also be established at some point convenient to the various factories owned by National Motors.

New Virginia Motors to Get Piedmont Plant

LYNCHBURG, VA., Jan. 9—The Virginia Motors, Inc., has been organized to take over the assets of the Piedmont Motor Car Co. The new company shortly will begin the operation of the old company's plant here, it is announced.

A Delaware charter is to be secured with the capital stock limited to $1,000,000. James T. Driver, formerly of Detroit and lately with Preston Motors, Inc., of Birmingham, has been made fiscal agent for the new corporation. Names of other men in the new organization have not been made public, but the experienced help of the old Piedmont company will be utilized.

MARTINI SHOWS DEFICIT

PARIS, Dec. 30 (*by mail*)—A deficit of 992,749 francs is shown on the year's working of the Martini Automobile Co. of Geneva, Switzerland. General depression and the state of the exchange market are given as the cause of the loss.

Rickenbacker Keeps All Its Old Officers

At First Stockholders' Meeting Company Is Reported in Flourishing Condition

DETROIT, Jan. 7—The Rickenbacker Motor Co.'s first annual share-holders' meeting re-elected all the original directors and officers. All executives remain the same as from the inception of the business. These are:

Byron F. Everitt, president and general manager; E. V. Rickenbacker, vice-president and director of sales; H. L. Cunningham, secretary-treasurer; R. M. Hood, assistant general manager in charge of purchases; C. M. Tichenor, factory manager, in charge of production, and E. R. Evans, chief engineer.

The report to the stockholders showed the concern to be in a flourishing condition and the prospects for the coming year most encouraging. The company has built 5000 cars, and also shows a profit on its first year's business permitting a 5 per cent dividend.

"Not a dollar has been borrowed from any bank," says President Everitt in his statement, "but we have discounted every bill from the first."

All Series A Cars Sold

According to Rickenbacker the company finished the year with practically all of its series A cars sold. There remains only a small stock in the hands of dealers and none at the factory.

The company's merchandising effort has been centered upon the building up of a distributor organization with strength both along financial and merchandising lines. Conservatism has been shown not only by the factory in building up this distributor organization, but also by the distributor in getting his dealers. The wisdom of this policy has been proved by the fact that of the distributors appointed since the Rickenbacker car was brought out at the 1922 shows, all are still on the list and actively functioning.

The company will continue to seek distributors this year and through them dealers in additional territories.

New Company Acquires Blower's Orville Plant

CLEVELAND, Jan. 8—The Swartout Co. has taken over the Orville, Ohio, plant of the Blower Co., together with its metal stamping business and equipment, and has opened a factory in the building formerly occupied by the Cleveland Milling Machine Co. in this city. The Swartout company has been organized by D. K. Swartout, former president, and W. E. Clement, former secretary of the Ohio Body & Blower Co.

The Blower company will continue the manufacture of automobile bodies, while the Swartout company will make ventilators, core ovens, enameling ovens, metal buildings, steam specialties, exhaust heads, steam and oil separators, steam traps and feed water heaters.

The new company will have a capitalization of $500,000 in 8 per cent preferred stock and 50,000 shares of no par common. The financing will include an issue of $200,000 in 7 per cent three-year debenture notes.

D. K. Swartout is president of the Swartout company; W. M. Pattison and D. K. Swartout, Jr., are vice-presidents, and W. E. Clement is secretary and treasurer.

CAR EXCEEDED RAIL PASSENGERS 6 TIMES

PHILADELPHIA, Jan. 10—Motor vehicles in the United States carried six times as many passengers during 1922 as the railroads, James W. Brooks, director of the American Highway Educational Bureau, told members of the Poor Richard Club in a world survey of the Automotive and Railway Transportation problems.

Motor vehicles also carried during last year 1,400,000,000 tons of freight, which was 80 per cent as much as that transported by the railroads. The upkeep of Pennsylvania's highway system in 1921 cost $9,723,000, and receipts from motor taxes during the same year totaled $9,496,690, he said.

Brings Anti-Trust Suit Based on Dealer Contract

AUSTIN, TEX., Jan. 8—Suit has been filed in the district court here by the State Attorney General's Department against the Pennsylvania Rubber Co. of America for forfeiture of its permit to do business in Texas and for penalties in the sum of $23,700 to $711,000 for alleged violations of the anti-trust laws. The home office of the company is at Jeannette, Pa. It is the first anti-trust suit to be filed in Texas in five years.

The Attorney General's petition alleges that the company, which is a manufacturer of automobile and bicycle tires and inner tubes, has a contract with certain Texas agencies in which it grants them exclusive territories and that, in addition, a price list is sent out for the guidance of the agencies in retailing tires which, it is agreed under the contract, must be followed.

MORE GERMAN BOSCH CAPITAL

PARIS, Dec. 30 (*by mail*)—The Robert Bosch Co. of Stuttgart, Germany, has increased its capital from 60 to 200 million marks. The Bosch-Metallwerke, at Feuerbach, a subsidiary of the Bosch Magneto Co., has also increased its capital from 5 to 20 million francs.

Assets of Liberty Outrank Liabilities

Receivership Follows Several Attempts Made to Reorganize Company

DETROIT, Jan. 8—The Liberty Motor Car Co. has been placed in the hands of the Security Trust Co. as receiver on petition of the Parish Manufacturing Co., with a claim of $5,107. In the petition, assets are placed at $2,400,000 excluding good will, and indebtedness, $1,500,000. The petition declares the company has made several ineffectual attempts to reorganize.

A statement by President Percy Owen of Liberty declared the company's difficulties were due to its inability to take advantage of the facilities of its new plant. This was occasioned principally he said, by the failure of large parts makers to make deliveries in the quantity ordered and finally brought about a condition which called for a complete reorganization.

Gross receipts of the company are declared in the petition to have totaled $2,700,000 last year.

Owen Formed Company

Percy Owen is the man who conceived the Liberty idea and formed the company which for six years has been carrying out the Owen idea—a medium priced car with body refinements as a most attractive feature. Owen's conception of what the public wanted in this line was gained from a connection with the industry dating back to 1902 when the Owen-Chamberlain Co. represented the Winton in New York City.

While with Winton, Owen was chosen by Alexander Winton to drive one of the Wintons that crossed the Atlantic to compete in the Gordon Bennett cup race in Ireland. Owen drove the little car in this event and Alexander Winton the other. This was America's first appearance in a foreign racing event.

A few years later Owen took over the representation of a foreign car, then became manager for Carl H. Page, who handled the Chalmers. From this connection he went to the Chalmers company as a factory executive. In 1916 he formed his own company.

Incorporated in 1916

The Liberty Motor Car Co. was incorporated under the Michigan laws in January, 1916, and in its first year turned out 733 cars. By 1921 production was well over 11,000. For three years the company showed a profit—$33,980 in 1918; $506,000 in 1919, and $32,504 in 1920.

The company was capitalized at $2,000,000 in common stock and $750,000, 8 per cent cumulative participating preferred. There was outstanding $709,699 common and $750,000 preferred, par $100, and no funded debt.

60,050 Cars Shipped Abroad in 11 Months

Motor Trucks to the Number of 9674 Were Exported During Same Period

WASHINGTON, Jan. 5—Nearly 70,000 cars and trucks were shipped to foreign purchasing centers from the factories in the United States during the eleven months ending with Nov. 30 last year. This total was taken from the monthly statement of automotive exports for November, as published today by the Automotive Division of the Bureau of Foreign and Domestic Commerce.

The exact figures for the eleven months are 60,050 passenger cars, having a value of $46,271,626; 9674 motor trucks, valued at $7,408,530, and parts, not including engines and tires, to a value of $34,880,851.

Export shipments in November, according to the statement, proceeded at practically the same volume as in the preceding months. The totals were 5276 passenger cars, 803 trucks and parts valued at $3,304,171.

The export shipments from the Canadian factories for the same month have not been announced.

Table That Shows Shipments of Products of the Automotive Industry from the United States in November, 1922, and the Totals for the Eleven Months of the Year

	Month of November				Eleven Months Ending November			
	1921		1922		1921		1922	
	No.	Value	No.	Value	No.	Value	No.	Value
Automobiles, including chassis	2,504	$2,215,310	6,146	$4,832,778	35,273	$40,016,282	70,000	$54,067,745
Electric trucks and passenger cars	....	....	67	82,124	....	....	276	387,589
Motor trucks and buses, except electric	429	368,120	....	....	6,969	9,837,839	....	....
Up to 1 ton	....	....	558	236,385	....	....	6,770	2,763,322
Over 1 and up to 2½ ton	....	....	207	269,651	....	....	2,253	2,831,420
Over 2½ ton	....	....	38	98,839	....	....	651	1,813,788
Total motor trucks and buses, except electric	429	368,120	803	604,875	6,969	9,837,839	9,674	7,408,530
PASSENGER CARS								
Passenger cars, except electric	2,075	1,847,190	....	....	28,304	30,178,443	....	....
Value up to $800	....	....	3,096	1,604,851	....	....	37,935	12,556,713
Value over $800 and up to $2,000	....	....	2,040	2,152,067	....	....	20,266	22,264,896
Value over $2,000	....	....	140	388,861	....	....	1,849	5,450,017
Total passenger cars, except electric	2,075	1,847,190	5,276	4,145,779	28,304	30,178,443	60,050	46,271,626
PARTS, ETC.								
Parts, except engines and tires	....	2,546,424	*14,882,229	3,304,171	....	36,374,879	*146,987,047	34,880,851
Station and warehouse motor trucks	....	....	2	970	307	239,065	130	132,917
Trailers	....	....	39	29,529	....	....	482	215,271
Airplanes	....	....	5	900	44	279,940	41	157,030
Parts of airplanes, except engines and tires	....	19,173	*2,583	3,393	....	156,128	*470,798	264,664
BICYCLES, ETC.								
Bicycles and tricycles	....	42,583	3,139	20,452	....	1,426,169	12,233	128,782
Motorcycles	498	140,970	1,440	347,368	10,138	3,267,312	14,539	3,711,481
Parts, except tires	....	....	*227,148	137,420	....	....	*2,678,656	1,453,818
ENGINES								
Gas engines	160	35,337	548	67,030	1,095	313,784	4,551	642,964
Traction engines (steam) except agricultural	3	4,535	4	6,898	73	118,372	34	65,126
Automobile engines	320	63,310	2,293	295,582	7,681	1,546,011	43,206	4,857,222
Aircraft engines	....	....	29	7,800	....	....	130	71,419
Complete tractors, except agricultural	25	32,617	4	5,993	5,199	5,740,980	45	122,198
Other internal combustion engines	694	68,108	509	76,893	7,611	1,502,774	4,652	728,307

*Pounds

Chamber in Mexico City May Hold Show This Year

MEXICO CITY, Dec. 29 (*by mail*)—The automotive division of the American Chamber of Commerce, under the chairmanship of J. G. Shirley, soon will decide definitely as to the holding of an automobile show within the next few months, as was done last spring and the year before.

Automotive sales conditions have improved, as the effects of the recent bank failures here are disappearing. The chief result of these failures, concerning which much misinformation has been circulated in the United States, has been to retire from circulation from ten to fifteen millions of pesos, which will be "frozen up" until the affairs of these institutions are liquidated. Business men in general were fearful of the effects of the financial troubles and buying was very dull for some weeks.

However, in the words of W. F. Saunders, secretary of the American Chamber, business has begun to pick up and in January it is expected to be even more favorable.

Although the automotive division has not reached a decision, it is generally hoped that it will determine upon holding a show in 1923. In the business community here, the automotive representatives are looked upon as being both capable and energetic, and it is felt that they will neglect no opportunities to push sales.

It is felt now that a more vital influence upon the future development of the automotive trade concerns roads and highways rather than a lack of money on the part of buyers.

PARISH & BINGHAM MEETING

CLEVELAND, Jan. 8—Stockholders of the Parish & Bingham Co. of this city will meet about Jan. 15, at which time important details of a financial program will be made public.

HAYES GETS IMPERIAL

DETROIT, Jan. 4—Sale of the Imperial Wheel Co. of Flint to the Hayes Manufacturing Co., Jackson, has been ratified by stockholders. The basis of sale is to be a valuation of $100 a share payable in cash or in Hayes stock at $28.50 a share. The Imperial plant will be devoted to the production of wheels for car makers in the Flint zone.

Men of the Industry and What They Are Doing

Goetchius Leaves for Europe

Morgan Goetchius, on the staff of J. D. Mooney, vice-president in charge of foreign affairs of the General Motors Corp., has sailed for Europe to investigate the possibilities of further development of the General Motors extensive operations in western Europe.

Mooney to Sail Feb. 3

J. D. Mooney, vice-president of the General Motors Corp. and president of the General Motors Export Co., will sail from New York on Feb. 3 on a two months' trip to England and some parts of Europe in connection with the sales of G. M. C. products in those countries. The General Motors, Ltd., which is the corporation's subsidiary in Great Britain, has been placed under Mooney's direction. The automotive outlook in England and some countries of the Continent is so bright, it was stated, that Mooney has under consideration extension of the corporation's activities there, this necessitating the forthcoming trip.

W. L. Adam of England Visits Here

W. L. Adam, founder of the A. B. C. Co. of Brooklands, England, which manufactured the well-known A. B. C. aircraft engine during the war, is at present in this country trying to interest manufacturers in a twelve-cylinder aluminum engine design which is remarkably light and compact for the power it is claimed to develop. The engine is of 3 in. bore and 5 in. stroke and measures only 21½ in. in length overall. It has steel cylinder sleeves in the aluminum block.

Fenn Arranges Lecture Course

F. W. Fenn, secretary of the motor truck committee of the National Automobile Chamber of Commerce, has arranged a lecture course among the colleges, choosing as his subject "Motor Truck Transport." He will speak at Harvard, Jan. 18, the University of Pittsburgh, Jan. 24 and Yale, Feb. 18.

Handley Appoints Morgan

George C. Morgan, formerly general sales manager for Earl Motors, Inc., has been appointed sales manager of Handley Motors, Inc. Morgan was formerly associated with the Willys-Overland Co. as branch manager at Toledo. He has had wide experience in the wholesale and retail end of the business and particularly in the merchandising of used cars.

Witherbee Rejoins Battery Maker

Thomas S. Witherbee has resumed his association with the Witherbee Storage Battery Co., Inc., New York City, in the capacity of vice-president. Witherbee, who was the inventor of the battery bearing his name, and who organized the business in 1903, has been connected in recent years with the Vacuum Oil Co.

Chain Belt Shifts Managers

Fitch S. Bosworth has been appointed manager of the Chicago office of the Chain Belt Co. of Milwaukee. He has been in charge of the company's St. Louis office for the last three years and has specialized in chain and conveying engineering problems. With him will be associated Raymond X. Raymond, who has been connected with the export sales department in Milwaukee for several years. Thomas F. Scannel, formerly of the Chicago office, has been placed in charge at St. Louis.

Howe Rubber Names Zerbe

Howard L. Zerbe has been appointed sales promotion manager in charge of all advertising for the Howe Rubber Corp. Zerbe is an old head in the rubber business, having come from the Kelly-Springfield Tire Co.

Berry Forms Distributorship

George M. Berry, identified with the industry since 1902, has organized the Berry Motor Car Co., St. Louis, which takes over the business of the Packard Motor Car Co. of Missouri, formerly a direct factory branch. During his association with the industry, Berry has served as assistant sales manager and director of branches for the Thomas B. Jeffery Co. and Willys-Overland, Inc. Associated with him is Edward S. Maddock, formerly connected with the Jeffery and Willys-Overland factories and identified with the Continental Guaranty Corp. of New York, a pioneer firm handling automobile paper for dealers.

Crooker Appointed in East

Richard A. Crooker has been appointed eastern district sales manager of the automotive division of the Columbus McKinnon Chain Co. His headquarters will be at 30 Church Street, New York City.

Chevrolet Promotes Wildgen

J. F. Wildgen, former superintendent of the Chevrolet plant in St. Louis, has been promoted to the position of manager of production to succeed J. H. Hunt, resigned. Hunt has joined the Durant organization and takes charge of the Hayes-Hunt corporation.

EMPLOYMENT IN CLEVELAND

CLEVELAND, Jan. 9—The employment trend in Cleveland automobile factories will be upward during January, according to a survey which has been made by the Cleveland Chamber of Commerce.

Rogers Rides Hobby at N.A.C.C. Dinner

"Cowboy Comedian" Enlivens Annual Event—Littleton Talks on Business

NEW YORK, Jan. 10—With a record breaking year back of them and a promising twelve months ahead, members of the National Automobile Chamber of Commerce thoroughly enjoyed the annual banquet at the Commodore Hotel last night. They laughed with Will Rogers, the cowboy comedian, and pondered deeply over the remarks of Martin W. Littleton, New York lawyer. The prosperous condition of the industry was reflected in the optimism displayed by the diners.

Undoubtedly this was the best of the long series of annual banquets given by the N. A. C. C. The affair brought out 950 diners, among them being practically all the leaders of the industry. Charles M. Schwab, the steel magnate and now the owner of Stutz, made his first appearance at a N. A. C. C. function, declining a seat at the president's table and enjoying the entertainment from the Stutz table. Pierre duPont, head of General Motors, also was among those present, as was W. C. Durant.

Refers to Executives

Will Rogers was in a happy vein and riding one of his hobbies when he talked about automobiles. He took many liberties with his subject, "kidded" several of the prominent manufacturers like W. C. Durant, Henry Ford, Col. Charles Clifton and John N. Willys. He referred to Durant as a man with more foresight than any other man in the industry. "He can see the time in the future when every man, woman and child in the country will own an automobile," said Rogers. "That is his vision. There will be one for every person. He is arranging his manufacturing schedule along that line. All he has got to do now is to arrange the birth rate."

Littleton, talking on how far the Government is likely to go in controlling business, declared that he sees a trend to mob rule in the proposal that Congress shall pass on Supreme Court decisions.

Directors Meeting

NEW YORK, Jan. 10—Directors of the National Automobile Chamber of Commerce held their monthly meeting today. It was a short session, however, lasting only a few hours, during which time routine matters came up. The directors received the report on December production and annual output.

FEW CHANGES MADE IN CAR PRICES

Less Talk This Year Than at 1922 Show

Cole Takes Most Radical Action, Reducing Open Car List $800

NEW YORK, Jan. 8—That the industry is back to normalcy is evidenced by the price situation. Whereas a year ago nothing but price was talked about at the show and around the hotels, this week little is heard of new lists. Not more than half a dozen companies had announcements of price changes to make when the show opened Saturday, and it is not expected that there will be many more during the week. Several of these were caused by new models or changes made in design of standing models.

Cole made the most radical cut, lowering the list on its open models $800, dropping from $2,685 to $1,885. On the sedan the reduction was from $3,685 to $2,685. Chandler, announcing a new line, cut $100 from the open job and $400 from the closed. Overland took off $15 from the sedan, the only cut made in the Overland line, while with the Willys-Knight there was a reduction of $150 on the five-passenger sedan and $200 on the seven-passenger sedan, while the coupe went from $1,795 to $1,695. Stephens also made a substantial reduction.

Following are the new prices:

AUBURN 6-51

	Old Price	New Price
2-passenger Roadster	$1,575	....
5-passenger Phaeton	1,475	1,275
7-passenger Phaeton	1,545	1,345
4-passenger Sport Phaeton	1,995	2,245
Sedan	2,345	2,245
Brougham	....	1,965

CHANDLER

	Old Price	New Price
5-passenger	$1,495	$1,395
5-passenger Sedan	2,295	1,695

EARL

	Old Price	New Price
Sedan	$1,795	$1,595
Brougham	1,795	1,595

The equipment on the Earl remains the same in both cases, and no changes are made in either body or chassis.

GRAY

The Gray coach has been increased from $760 to $785.

KING

	Old Price	New Price
2-passenger Roadster	$1,495	$1,595
5-passenger Phaeton	1,495	1,595
4-passenger Sport	1,495	1,595
Coupe	2,200	2,200
Sedanette	1,995	1,995
Sedan	2,400	2,400

124 W. B.

	Old Price	New Price
Coupe	$1,995	$2,550
Sedan	2,550	2,625

Lexington

	Old Price	New Price
Roadster	$1,695	$1,795
5 pass. Phaeton	1,695	1,795
7 pass. Phaeton	1,695	1,795
5 pass. Sport	2,045	2,145
5 pass. Calif. Top	1,995	2,095
7 pass. Calif. Top	2,095	2,195
5 pass. Royal Coach	2,145	2,245
4 pass. Coupe	2,345	2,445
5 pass. Sedan	2,545	2,645
4 pass. Brougham	2,645	2,745

OVERLAND

	Old Price	New Price
Sedan	$875	$860

PAIGE

	Old Price	New Price
7-passenger Phaeton	$2,195	$2,450
4-passenger Phaeton	2,245	2,450
3-passenger Roadster	2,495	2,695
5-passenger Brougham	3,155	3,135
5-passenger Toursedan	3,100	3,235
7-passenger Toursedan	....	3,235

STEPHENS

	Old Price	New Price
2-passenger Roadster	$1,575	$1,345
5-passenger Phaeton	1,595	1,295
7-passenger Phaeton	1,625	1,685
4-passenger Sport	....	1,985
Toursedan	....	1,595
5-passenger Sedan	....	1,895
7-passenger Sedan	2,550	2,385

WESTCOTT

	Old Price	New Price
Sedan	$2,890	$2,490
Special Sedan	....	2,690
Brougham	2,490	2,490
Closure (Coupe Sedan)	....	1,795
Special Closure (Coupe Sedan)	....	1,995

WILLYS-KNIGHT

	Old Price	New Price
Coupe	$1,795	$1,695
Coupe Sedan	....	1,595
5-passenger Sedan	1,950	1,795
7-passenger Sedan	2,195	1,995

Ford Buys St. Paul Site for $10,000,000 Factory

ST. PAUL, Jan. 10—Ford Motor Co. has completed the purchase of 167½ acres on the Mississippi River, adjacent to the Government high dam, at a cost of $315,000. Application has been made to the Federal Government for the power rights at the dam, but if this is denied the company will erect a plant to be operated by steam.

With water-power rights, the company will build a $10,000,000 plant, representatives of Ford said, to employ 15,000 men. It will be on a somewhat smaller scale if the power-rights are denied. Preliminary work will be started in March.

The plant will be used for the manufacture of cars and tractors, the Ford men declared.

CASSIDY ENDS BUSINESS

NEW YORK, Jan. 9—The Edward A. Cassidy Co. of New York City, long a prominent figure in the industry as a jobber handling a number of well known accessory lines, discontinued its business the first of the year.

Cole Discount Plan Is Aimed at Trading

Company Expects to Eliminate Trade-in by Cutting Dealer Commissions

NEW YORK, Jan. 11—The Cole Motor Car Co. in reducing its prices $600 to $1,000 has adopted a new discount policy which is expected to eliminate trading in used cars by the Cole dealer organization. The new discount, which materially cuts down the former dealer commission, has been placed at a figure where, it is believed, dealers will have to hold themselves strictly to actual market values in fixing used car allowances. The company expects the new Cole prices to provide dealers with an effective weapon to bring about the sale of the car as a transaction by itself, while acceptance of the used car, if it is accepted at all, becomes an accommodation to the new car buyer without expense to the dealer.

The new sales plan is a frank recognition of the company's belief in the fallacy of the long discount for trading purposes or the special trading discount.

The new Cole prices, which are being relied upon to bring car owners into the market ready to dispose of their used vehicles without concessions in the way of allowances beyond actual values, show the following comparisons with those prevailing before the price reduction announcement at the opening of the New York show:

	Old Price	New Price
7-passenger	$2,685	$1,885
4-passenger Sport	2,685	1,385
2-passenger Roadster	2,685	1,885
Coupe	2,885	2,585
Sedan	3,685	2,685
Toursedan	....	2,685

Previous prices included ultra equipment consisting of Lovejoy shock absorbers, trunk rack, body bars, three-quarter aluminum runningboard, wheel carriers on both sides and individual mudguards. The new prices do not include this equipment, which is priced at $250 extra on all models, disk or wire wheels being $35 extra.

PLAN LECTURES FOR TIRE MEN

DES MOINES, Jan. 9—Foremen of Des Moines tire factories will hold a series of conferences this winter at which lectures will be given by E. J. Reeder of the engineering extension department of Iowa State College. Fourteen conferences in all are planned.

The aim of the conferences is to deal with the broader phases of factory control and management. Similar meetings for other trades were held last winter.

NEW MERCHANDISING PLANS ADOPTED

Handley Motors Has Profit Sharing Plan

Contract Permits Dealer to Participate in Returns in Excess of 6 Per Cent

NEW YORK, Jan. 10—In offering an entirely revised line of cars, Handley Motors, Inc., successor to the Handley-Knight Co., is offering a revised dealer contract that is a forward step on many points that previously have caused disputes between factory sales department and merchant.

The contract is written without the use of the word "dealer," and at all points regards the two parties to the contract as seller and buyer. It makes no distinction between wholesale and retail dealers, that point being entirely settled by the sliding scale of discount on the number of cars bought during the contract year. All dealers will have direct contracts with the factory, and the problem of sub-dealers is entirely between the sub-dealer and the dealer who holds the contract with the factory.

Maker Gets 6 Per Cent

All provisions of the contract are based on a profit sharing plan, whereby the dealer shares equally with the manufacturers in all profits above 6 per cent of the manufacturing profits. Six per cent has been taken as a fair return on the stock, and after this amount of dividend has been paid, the remaining profits will be halved with dealers and stockholders. The distribution to the dealers will be based on the net purchase price of all cars taken by the dealer during the calendar year. All sales contracts are renewable on Dec. 31 of each year.

Aside from this provision, the first radical change in the contract is in the question of "price changes and rebates." Three methods of price changes and dealer compensation are provided:

The factory can lower the price of the cars and immediately remit to the dealer the compensation for such a reduction based on the number of unsold cars.

The factory can reduce the price and at its option credit 20 per cent of the reduction on cars in the dealers' hands against future orders.

The above methods provide for compensation in case the reductions originate with the factory.

In case the dealers see the need of a price reduction to meet competition and this reduction is favored by 75 per cent of the dealers, then the matter of compensation for unsold cars shall be adjusted to the approval of 75 per cent of the dealers.

President Handley, in discussing this part of the contract, recalled the different reasons for price reductions, which he summarized in this way:

A price reduction due to lower price of parts and materials and increased production finds the factory prosperous and entirely willing to rebate in cash immediately.

A reduction based on what the factory realizes as a competitive need is sometimes likely to be embarrassing and then the 20 per cent applied to future sales should be welcome to factory and dealer alike.

A reduction based on dealer demand takes still another view of the situation and Handley believes that the dealers would be quite willing to assume some of the burden of such a move.

The contract is written for one year but is perpetual at the option of the buyer (dealer) as long as he functions to the satisfaction of the factory. The contract can be cancelled for "cause" but no attempt is made to define exactly the meaning of "cause." It is in Handley's mind that such a cause will be the obvious failure to sell a proper proportion of cars to population, as based on the performance of other dealers.

When the contract is cancelled, it is the option of the factory to take back the cars in stock at 100 per cent or at the demand of the dealer at 90 per cent of the invoice value. This same arrangement shall apply to repair parts.

It is unusual in this contract that the dealer is not bound to sell both the $1,350 and the $2,150 models, but can become a dealer in either one or both, as they fit into his line. It is in no sense an exclusive dealer contract.

This contract does not require a definite purchase of parts but provides for a service department adequate to take care of the cars sold.

Overland Dealer Pays 15 Per Cent with Order

NEW YORK, Jan. 8—A new dealers' policy has been announced by the Willys-Overland Co., which reports that it has more retailers here than ever before. It is estimated that there will be 750 in attendance at the annual banquet Thursday night.

This new wholesale financing plan, which went into operation the first of the year, is designed to enable the dealer to stock up during the winter months and be ready for spring business. It provides that the dealer pay 15 per cent of the net price when he orders, the balance being time payments running from two to six months with interest charges of 6 per cent plus 2 per cent per annum. If the dealer discounts he gets 6 per cent rebate, but pays the 2 per cent, which represents bookkeeping charges.

The Overland financing plan will be carried by the Commercial Credit Co., which recently succeeded the Continental Guaranty Co.

R & V to Make Sales Through Any Dealer

New Plan Affects Only Smaller Cities—Distributor Given Protection

NEW YORK, Jan. 9—Under a plan of merchandising by which it is hoped to reach the prospect for high priced Knight engine cars in smaller cities, the R. & V. Motor Co. is announcing at the show its intention to sell through any dealer who may have such a buyer. The plan does not require the dealer to carry any R. & V. demonstrators, the demonstrator being brought from the nearest distributing center of the company. For sales made in this way the company will give dealers a 10 per cent discount.

Under the plan the company will concentrate its direct sales efforts in the large cities and will reach the occasional Knight buyer in the smaller cities through the medium of dealers in other lines. Where these dealers carry one demonstrator, they will be given a 15 per cent discount, and where both open and closed demonstrators are carried, 20 per cent is allowed.

Distributor Supplies Parts

The distributor in the territory is protected in all business, because the sale is made through him either directly or indirectly. Servicing will be handled through the dealer making the sale, who, however, will not be required to carry parts, but who can get them from the distributor. With each car a complete instruction manual will be sent, so that for ordinary repairs any garage may do satisfactory work.

The sales plan is in conjunction with a two-year guarantee against engine repair which the company is now offering for the first time. When sold the engine is sealed, and if the seal is broken inside two years, the factory will bear all costs under a flat rate system which it has evolved. The company exempts itself from any responsibility where accidents cause engine derangement. The guarantee, officials said, is to show the company's absolute confidence in its Knight engine.

TIMKEN BEARING BRANCH BUSY

COLUMBUS, Jan. 9—The local branch of the Timken Roller Bearing Co. reports that additional men are being employed day by day, the total now being in excess of 800. Both a night and day force are at work. It is planned to increase the output of the branch when the equipment is put into condition for operation.

Export Heads Talk Ignition Standards

Question Will Be Taken Up with Makers by Directors of N. A. C. C.

NEW YORK, Jan. 9—A concerted move toward standardization of the ignition equipment on passenger vehicles shipped abroad was taken at the annual meeting of the export managers of the National Automobile Chamber of Commerce, held here yesterday. Under the resolution adopted, the directors of the N. A. C. C. are requested to take up with each manufacturer the question as to whether or not it is advisable to standardize on such equipment and whether or not a definite date can be fixed after which no member company will export any cars carrying ignition equipment other than that used in the domestic market.

Date Left Open

The final result of the action taken yesterday will be to make battery ignition standard for export models on all lines, except those which fit magneto ignition as regular equipment. A proposal to fix Jan. 1, 1923, as the time for beginning standardization was made by H. M. Robins, the foreign manager of Dodge Brothers, but the date was eliminated in the final resolution, leaving it to be fixed, if at all, by the N. A. C. C. directors and the member companies.

The question as to battery or magneto ignition on export cars has long been a perplexing trade problem, and the export managers are now in the position of seeking to remedy the present situation, doing away with the necessity of changing equipment on the foreign cars. Some companies, notably Hudson, do not fit magneto on any of their cars; other companies have done so only when specifically requested and generally at a price higher than on the standard domestic models.

One of the problems before the export section of the industry is to reduce as much as possible the cost of cars for the foreign buyer, and the effort to eliminate the magneto was described by speakers as being one step in this direction.

Battery Stations Abroad

The limiting factor preventing any change is, of course, that of battery service facilities in the foreign territories. That battery service stations have been opened in many places was stated at the meeting by W. P. Baranowski, S. J. Kelly and R. C. Thompson, export managers for Willard, Exide and Prest-O-Lite batteries, each of whom described the efforts being made to push battery service abroad. Stations have been opened in all of the larger centers, it was stated. One of the companies has its own branches in the more important export localities, with sub-agencies in other cities. Forty-two such agencies have been opened by one company in Argentina alone and, within the last month, a station has been started in Iceland, which has a few score of cars.

The suggestion was made by speakers that the battery companies form a company under the Webb act to push foreign sales, but this was combated by the battery men. Then it was suggested that the companies join in an advertising or publicity campaign in foreign territories to exploit battery ignition, just as the Rubber Association of America has done in promoting the use of straight side tires. It also was brought out that the Automotive Electrical Association had taken little or no action regarding the foreign service problems, and it was thought that this association might well be of assistance in bettering conditions abroad.

Cadillac Now Operating on Big Output Schedule

DETROIT, Jan. 8—Factories of the Cadillac Motor Car Co. are now on a large production schedule, which will increase with each succeeding week for the next several months. The expansion program commenced Dec. 1, when the inrush of business from the Cadillac price reduction began to be felt. As a result of continued operations during December the production for the month was unusually large. It is estimated that almost the entire output was consumed by deliveries.

To take care of the unprecedented winter business and for the spring demand, the factory force, which at this time is approximately as large as in any period since the opening of the new Cadillac plant in early 1921, is being increased.

Cycle Makers to Push Their Insurance Work

NEW YORK, Jan. 10—A. B. Coffman, secretary of the Motorcycle and Allied Trades Association, announced today that all but 18 spaces had been taken for the motorcycle show which is to be held at the 71st Regiment Armory, New York, Feb. 12-17. The announcement was made at the annual meeting of the association held at the Hotel Astor.

It was decided at the meeting to push more vigorously the insurance work which was started last year, as increased business is necessary if reduced premiums are to be obtained.

The present board of directors was re-elected.

KORAX CO. ORGANIZED

NEW YORK, Jan. 9—L. M. Lloyd, Ira H. Washburn, G. B. Gosman and E. C. Wright have formed the Korax Co., with headquarters at 56 West Forty-fifth Street, this city, jobbing a line of automotive equipment.

Stage Stars Appear at M.A.M.A. Dinner

President Broadwell of Association Makes Only Speech, and That Brief One

NEW YORK, Jan. 11—As usual, the banquet of the Motor and Accessory Manufacturers Association at the Commodore was a brilliant success. Following the custom there were no speeches, other than the brief address of welcome by President E. H. Broadwell.

After the dinner the entertainment started, the program consisting of top liners from all the biggest Broadway successes. It was a pretentious affair to be staged in a ballroom, but so well were the plans laid that the affair went through without a hitch.

Will Rogers, who talked to the banqueters at the dinner of the National Automobile Chamber of Commerce the night before, was on the M. A. M. A. bill last night. That part of his speech in which he defined his idea of what the M. A. M. A. is stirred the diners to loud applause. Said Rogers:

Last night I was conscripted and forced to associate with the high lights of the automobile industry. Now, I tried to say a good word for those unfortunate millionaires but today I have learned through reliable sources that they really are not as bad as I thought. I thought they were the cause of all the ills of the industry but now I find I was wrong. You (referring to the accessory folk) are the Lenins and Trotzkys of the business.

You can get a license for $2 and married for $5 but O boy! wait until you start in making her look as good as the other fellow's wife. You are like the big store owners—sell the stuff that goes on them after the marriage and never monkey with the original $7 that starts you in the business.

Rogers' solution of the traffic problem is to have eastbound traffic on Mondays, westbound on Tuesdays, with Sundays set aside for the week-end drivers, followed by a parade of ambulances. He added that any driver who misses a pedestrian should not be given a second chance to maintain his marksmanship.

Officers Chosen

NEW YORK, Jan. 11—Following yesterday's annual meeting of the Motor and Accessory Manufacturers Association at which the four retiring members of the board of directors—W. O. Rutherford, G. Brewer Griffin, J. McComb and C. H. L. Flinterman—were re-elected, the new board met today and selected the following officers: President, W. O. Rutherford, vice-president of B. F. Goodrich Co.; first vice-president, A. W. Copland, second vice-president, H. L. Horning; third vice-president, E. P. Hammond; treasurer, L. M. Wainwright, who was elected to this office for the fifteenth consecutive time; assistant treasurer and secretary, G. Brewer Griffin; general manager, M. L. Heminway, and general counsel, S. S. Meyers.

Nash Motors Netted $7,613,246 in 1922

Gross Business Approximated $40,000,000—Cars Sold Aggregated 40,000

NEW YORK, Jan. 10—Nash Motors Co. net profits in the year ending Nov. 30, last, were $7,613,246, after expenses, inventory reserves, depreciation and State and Federal taxes, according to President Charles W. Nash in a statement to stockholders. The gross business approximated $40,000,000. Nash reported 40,000 cars sold and a daily average of 4000 men employed at the factory.

The balance sheet showed cash $18,587,387; materials and supplies, $4,464,027; real estate, plant and equipment, $8,349,212; notes receivable, $72,500; accounts receivable, $2,486,788, and accounts payable, $2,586,970. The surplus was $20,127,172. Dividends during the year totaled $1,136,100.

Orders on hand today are larger than a year ago, Nash said, and a larger business is expected in 1923 than in the year past. Prices on automobiles can be considered at the bottom point and that the cost of producing them will increase. Increased competition will cut the margin of profit for manufacturers, Nash declared.

Four-cylinder business during the year reached 15,000 cars. He notes that the company has bought control of LaFayette Motors Corp. stock and says the new plant for LaFayette has just been completed and will be in production by February. The company retired 5000 shares of preferred in 1922. Total now outstanding is $2,123,100. This has been called for retirement as of Feb. 1, 1923.

January Gives Promise of New Output Record

(*Continued from page* 90)

siderably hampered through the failure to get through sufficient closed car bodies to meet the demand. Anything like a normal condition is not looked for until additional body making facilities now under way are available, sometime before the spring of the year.

Dealers are not stocking closed cars, chiefly because of the pressing demand and the delay in getting them through to meet current orders and will be unable to accumulate great stocks of open cars until rail equipment now being used for closed models can be utilized for their shipment.

Bearing directly on the remarkable record made during the past year in car and truck production is the showing by the parts manufacturers whose business for the twelve months will come close to half a billion dollars.

Industry Established New Production Record in 1922 and Also Made High Mark for December

NEW YORK, Jan. 8—Figures compiled by the National Automobile Chamber of Commerce place the total production of cars and trucks for the year, 1922, at 2,576,000, or an excess of 370,803 over 1920, the best previous year.

The figures show that in December the output was 225,000, which established a new record for that month. The report for the year is as follows:

	Output	Carloads			Driveaways			Boat		
	1922	1920	1921	1922	1920	1921	1922	1920	1921	1922
January	91,109	20,057	6,485	15,357	29,283	3,185	7,479	....	93	143
February	122,366	25,505	9,986	19,636	43,719	7,507	10,173	....	99	180
March	172,720	29,236	16,287	27,753	57,273	9,939	16,917	....	75	560
April	219,558	17,147	20,187	31,334	64,634	14,197	22,381	....	1,619	2,960
May	256,219	21,977	18,608	33,416	74,286	15,193	28,827	....	2,381	7,406
June	289,011	22,516	20,269	34,230	60,746	18,834	33,857	8,350	3,947	7,737
July	245,414	23,082	19,514	29,116	52,342	15,533	28,100	8,702	3,726	7,030
August	273,425	23,386	20,758	32,814	34,060	15,218	36,754	7,095	3,595	10,096
September	205,784	20,804	19,002	25,950	24,431	13,840	30,055	5,469	2,959	8,002
October	238,514	17,209	17,808	26,980	14,127	12,971	33,320	2,519	2,226	7,040
November	235,854	13,253	14,264	27,232	9,497	10,528	27,376	659	1,402	5,070
December	225,000	11,802	12,100	26,900	6,469	7,500	27,500	89	134	1,300

Business for the eleven months aggregated $384,226,070 or an excess of $150,524,508 over the same period of 1921. For November the sales amounted to $36,616,450, with collections running on a par with September.

Orders are booked well in advance and with few exceptions, factories manufacturing parts are operating at an encouragingly high mark.

The truck branch of the industry is improving, with an increasing volume of its output consisting of rail cars and motor buses. Light duty vehicles are reported in greatest demand and as a result, operations in a great measure revolve around this size of truck. Further betterment in general industrial conditions will be accompanied by an expansion of schedules to meet the resulting demand.

S. A. E. Division Reports Meet Committee Approval

NEW YORK, Jan. 9—The reports of twelve of the sixteen reporting divisions of the Standards Committee of the Society of Automotive Engineers were carried without discussion at the meeting of the committee today.

Two reports, those of the Motor Truck division on cabs and the Ball and Roller Bearings divisions on metric type thrust bearings, were referred back to the committee, and two others, those of the Electrical Equipment division on spark plugs and the Lubricants division, were carried after discussion, and in the latter case with some modification.

The divisions whose reports were adopted without discussion included the Axle and Wheels, Electric Vehicle, Engine, Frames, Iron and Steel, Lighting, Nomenclature, Parts and Fittings, Passenger Car Body, Screw Threads, Storage Battery, Transmission and Truck divisions.

M. A. M. A. Announces Plans for Meeting

NEW YORK, Jan. 10—E. W. Clark, advertising manager of the Clark Equipment Co. and chairman of the Advertising Managers Council of the Motor and Accessory Manufacturers Association, has rounded out his program for the Chicago meeting, which will be held in the Rose Room of the Congress at Chicago Wednesday, Jan. 31, starting at 9:30 a. m.

The theme selected is: "How Can the Parts and Accessory Manufacturers Aid in the Development of the Market for Specialized and Fully Equipped Cars and Trucks?"

The program follows:

1. Introductory paper by Ezra W. Clark.
2. The Theme in Relation to the Car Manufacturer (Speaker to be announced).
3. The Theme in Relation to the Dealer, by Clyde Jennings, Editor, *Motor Age*, Chicago.
4. The Theme in Relation to the Parts Manufacturer (Speaker to be announced).

Luncheon

5. The Theme in Relation to the Advertising of the Parts Manufacturer (Speaker to be announced).
6. The Theme in Relation to the Value of Accessory Equipment (Speaker to be announced).
7. The Theme in Relation to Advertising Copy Appeal by E. C. Tibbitts, central manager Wm. H. Rankin Co., Akron, (formerly advertising manager of the B. F. Goodrich Rubber Co. and ex-chairman of the Advertising Managers Council).
8. The Theme in Relation to What Equipment Should be Featured on Cars and Trucks going into Export, by Gordon E. Lee, export manager, Yellow Cab Manufacturing Co., Chicago.

E-B SHIPPING TO FRANCE

ROCKFORD, ILL., Jan. 8—An order for more than 100 carloads of agricultural machinery for the French branch of the Emerson-Brantingham company during the early months of 1923 has been received here.

Committees Approve Waltham Watch Plan

Company Will Be Reorganized If Body of Stockholders Give Their Consent

NEW YORK, Jan. 9—Stockholders of the Waltham Watch Co. will vote at a special meeting Feb. 8 on a plan of reorganization which has been approved by committees representing common and preferred stockholders. If approved, the plan provides for the incorporation of a new company in Massachusetts to take over assets and liabilities of the existing company. Under the plan new securities will be issued which will be underwritten by a banking syndicate and which will also be offered to stockholders.

Under the plan the capital and funded debt of the company will be $3,000,000 first mortgage 20-year 6 per cent bonds, $3,000,000 5-year 6 per cent debentures, $1,700,000 7 per cent prior preference stock, $5,000,000 6 per cent preferred stock, 25,000 shares of no par value Class A common stock and 70,000 shares of Class B common stock.

Notes and Loans to Be Paid

The company now has outstanding $4,200,000 bank loans and $3,000,000 coupon notes. These will be paid off in cash from proceeds of the sale of stock and bonds to bankers, and the sale of $1,700,000 preferred stock to common and preferred stockholders.

For the payment of $5,300,000 in cash the banking syndicate headed by Kidder, Peabody & Co. will receive $3,000,000 first mortgage bonds, $3,000,000 five year debentures, 10,000 shares of 6 per cent preferred stock and 7,000 shares Class B common stock. The syndicate also has underwritten the $1,700,000 of preferred stock which will be offered, thus insuring the $7,000,000 needed to pay off notes and bank loans.

Dumaine Will Be President

Frederic C. Dumaine will be president of the company, and with a new board of directors and the financial backing of Kidder, Peabody & Co., will be responsible for the management of the company. He and his associates will buy 25,000 shares of Class A common for $250,000. The syndicate will receive no compensation for underwriting the new securities.

The plan provides that each preferred stockholder who subscribes $20 for each share of preferred stock now held will receive the face amount of new preference preferred and eight-tenths share of new 6 per cent preferred. Preferred stockholders approving the plan, but not subscribing will receive one-quarter share of new 6 per cent preferred for each share of preferred now held.

Common stockholders for the subscription of $10 a share will receive a face amount of new prior preference preferred stock and nine-tenths share of new Class B common. Common stockholders approving the plan but not subscribing will receive for each share held one-quarter share in new Class B common.

From 20 to 25 per cent of the business of the Waltham company is now in automotive products—speedometers, automobile clocks. In 1922 its automotive business ran 40 per cent ahead of the former year. Under the reorganization it is expected the automotive business will be expanded.

Macauley Answers Suit Government Plans Filing

NEW YORK, Jan. 10—Filing of suit by the War Department against Packard Motor Car Co. for return of alleged "unduly large profits" made under Government contracts for Liberty engines has been discounted by President Alvan Macauley, in a statement to stockholders in which he outlines the terms of contract and conditions under which the contracts were fulfilled.

He declares a preliminary report by a committee considering audits of war contracts indicates the company may be asked to return approximately $6,000,000. The claim if ever pressed, he said, would not be serious since taxes paid by the company on its earnings would have to be refunded, reducing the amount under consideration to about $2,000,000.

If the War Department cannot be made to see the unfairness of its attitude, he says, the company will welcome the opportunity to ascertain on behalf of itself, and other manufacturers similarly situated, whether the Government can repudiate its obligations and whether manufacturers can deal in safety with it at all.

Citroens Cross Sahara and Reduce Camel Time

PARIS, Jan. 9 (*by cable*)—The Citroen company has been advised by wireless from Timbuctoo that the automotive conquest of the Sahara desert has been accomplished by the Citroen expedition, consisting of five Citroens fitted with caterpillar treads.

This caravan crossed the Sahara from Algeria, on the north coast of Africa, to French West Africa, making the 2000 mile trip from Tugurt to Timbuctoo in twenty-one days in comparison with the minimum of three months required by camel caravans.

VELIE 1923 SCHEDULE

MOLINE, ILL., Jan. 8—The Velie Motors Corp. production schedule for this year will be more than double that of last year, F. E. Bradfield, vice-president and manager, has announced. The 1923 goal will be between 10,000 and 15,000 cars; in 1922 the production was 5500. Steady production with the present force will be the rule rather than great increase in the number of employees.

McElwain Chairman of Springfield Body

Newly Formed Company Announces That Its Financing Has Been Completed

NEW YORK, Jan. 9—Charles C. McElwain, treasurer of Kidde Bros. & Co. and director of the Safe Deposit & Trust Co. of Springfield, Mass., has been elected chairman of the board of directors of the newly organized Springfield Body Corp.

It is also announced that the financing of the corporation has been completed, and the work of equipping the two plants acquired at Bloomfield, N. J., and at Pontiac, Mich., finishing the addition to the Springfield plant and assembling the personnel and working forces, is well under way.

In addition to McElwain, other directors are Harry G. Fisk, vice-president of the Fisk Rubber Co. and a director of the Union Trust Co.; Frank A. Woods, a director of the Safe Deposit & Trust Co., and of the Farr Alpaca Co. of Holyoke, Mass., and Victor M. Tyler, president of the Acme Wire Co. of New Haven and a director of the Gotham National Bank of New York. C. S. Dame, president; A. H. Wolfe, vice-president, and Frank M. Livingston, controller, are also directors.

Kammer Supervises Manufacture

M. H. Kammer, who has had 25 years' experience as a custom body builder, has been placed in charge of the manufacturing division. B. O. Provins, formerly identified with Rolls-Royce, is assistant to Dame. J. W. Sarles, also previously with Rolls-Royce, will serve as works manager of the Springfield plant, and R. J. Schuler, formerly associated with the Detroit Gear & Machine Co., will act as Detroit representative.

The Bloomfield and Pontiac plants together with the original Springfield unit will have a yearly output of 15,000 bodies of the custom-built type. The factory at Bloomfield, which has been purchased from General Motors, contains 175,000 sq. ft. of floor space and occupies 14 acres. It is located on the Erie Railroad and has extensive storage facilities for chassis and completed cars. Vice-president Wolfe has taken direct charge of this unit and will have it in operation by April.

The Pontiac plant has 280,000 sq. ft. of floor space, includes 16 acres and is located on the Grand Trunk Railroad. It was purchased from the Friend Motor Co. Kammer will have direct charge of this unit and plans to have it in operation by July.

FIRE AT VICTOR PLANT

SPRINGFIELD, OHIO, Jan. 10—Fire which started early today from unknown origin destroyed the dryer building at the plant of the Victor Rubber Co.

Goodyear, Firestone, Move Up Their Lists

Last of Akron Tire Builders Who Have Joined in Higher Price Movement

AKRON, Jan. 8—After threatening to hold out against the general price increasing movement launched by practically all other rubber companies in the country, Goodyear and Firestone of Akron have capitulated, and have announced increases commensurate with those of principal competitors.

Goodyear's price advances range from 7 to 12½ per cent, effective Jan. 8. Firestone, although not having its lists of new price schedules ready for release, has announced officially that the new prices will be made retroactive and effective as of Jan. 2.

This brings into the fold all of the rubber companies. Goodrich was the first in the Akron district, enforcing an average of 12½ per cent increases Dec. 30. Smaller companies followed suit, some making their changes effective Dec. 30, others on Jan. 2 and still others on Jan. 8. The Mason Tire & Rubber, having increased tire prices 5 per cent in November, will add from 9 to 12 per cent Jan. 15.

Senator Presents Report

WASHINGTON, Jan. 9—Increases in automobile tire prices amounting to 100 per cent within two years were predicted by Senator Medill McCormick in submitting to the Senate a statement prepared by the Department of Commerce, relating to British colonial rubber restriction laws. The report emphasizes the fact that an economic price for rubber has a great influence upon the development of highway transportation.

It is stated in the report that by Nov. 1, 1923, the available stocks of rubber will have been reduced to a six months' supply, whereas an eight months' supply is taken by the Stevenson Committee, comprised of British government officials, plantation owners and rubber growers, as a necessary supply to do business.

Cars, Bodies, Equipment Displayed at Ford Show

NEW YORK, Jan. 8—The Industrial and Commercial Power and Transportation Show, which will continue for two weeks, opened today in the Ford Building on Broadway. All types of Lincoln and Ford cars are on display, as well as many varied forms of equipment which may be used in connection with Ford products.

Commercial bodies are being shown by the Heintz Manufacturing Co., Hercules Body Co., York Body Co., Mifflinburg Body Co., Newman Commercial Car Body Co. and the Martin-Parry Co.

Steel dump bodies are displayed by the Eastern Car & Construction Co., Griscom-Russell Co., Hughes-Keenan, Eagle Wagon Works and the Anthony Body Co. An oil tank body for installation on Ford chassis is being exhibited by the Heil Co.

The Wayne Body Co. is showing a school bus body and a hearse body, and a chemical combination fire wagon is displayed by the Riddle Manufacturing Co. For Fordson power Ingersoll-Rand Co. shows an air-compressor; Stark Plow Co., a snow plow, and the Milwaukee Concrete Mixer Co., a concrete mixer, while portable wood saws and similar equipment are being shown by the Moorewood Saw Co., Chase Turbine Co., Hertzler & Zook and the American Saw Mill Machinery Co.

Railroad equipment is being exhibited by the Adamson Locomotive Co., Hill & McMillan Co. and the Eastern Car & Equipment Co., and power winches are displayed by the Ersted Machinery Co. and C. W. Myers.

Earl Expects to Build 1500 Monthly by April

DETROIT, Jan. 8—George C. Scobie, new president of Earl Motors, Inc., reports the factory making steady gains in production and expects operations to be on a basis of 1500 monthly by April. Manufacturing will not be pushed until after the New York and Chicago shows, he said, but in the meanwhile the factory force will be built up in preparation for heavy business later.

W. E. Stalnaker, sales manager, reports that orders are being received in satisfactory volume and that the company is encouraged over future business. New dealers are being obtained by the company, he said, and distributing contracts have been signed in important centers of the country, notably Boston and Los Angeles.

Jobber Must Understand Parts, Association Says

NEW YORK, Jan. 9—The automotive equipment jobber who would build and retain a profitable distribution business in replacement parts must understand parts and must give good delivery service, in the opinion of members of the Eastern Automobile Equipment Association who held a long discussion on the subject at their annual meeting here.

It was brought out that the jobber cannot compete with the exclusive parts distributor unless he carries adequate stocks of the parts lines which he represents, nor can he hope to get this business unless he has men in the purchasing and sales divisions of his business who will thoroughly study parts so that dealers or garagemen can get what they want when they want it.

The jobber naturally has an advantage in the distribution of any product because of his frequent contact with the trade but he loses this advantage if he tries to make it an unimportant side line of his business.

Dealer Attendance Is Feature of Show

Other Visitors at Grand Central Palace Increase After First Three Days

NEW YORK, Jan. 11—The show attendance this year is featured by the large number of dealers who have gathered here from all parts of the country. There have been few shows which have seen so representative a dealer gathering.

It is evident that a great many shifts are being made in the dealer organizations. Sales managers at the exhibits and at the headquarters of the various companies are busy signing up new representatives.

Proof of the unusually large dealer attendance is shown at the various luncheons being held in connection with the show. Dodge Bros. entertained 1500 at its luncheon; Franklin, 400; Overland, 700; Oakland, 300; Oldsmobile, 300; Paige-Jewett, 300; Studebaker, 300; Hupmobile, 300, and Chevrolet, 1000.

In addition to the dealer meetings a number of important conferences were held by distributors and branch managers, and Rickenbacker staged its first factory-owner meeting at the distributor's rooms in this city.

While the general attendance during the early part of the week was not so large as in previous years, it showed marked improvement beginning Wednesday. Tabulations by S. A. Miles, show manager, show that Wednesday's crowd equaled that of any single day in former shows.

JOBBERS HOLD MEETING

NEW YORK, Jan. 10—More than 1000 persons interested in selling automotive equipment attended a merchandising meeting in Carnegie Hall this afternoon as guests of the Metropolitan jobbers in the Automotive Equipment Association.

The speaker of the meeting was Ray W. Sherman, merchandising director of the A. E. A.

Two Shows to Be Held In France During Year

PARIS, Jan. 1 (*by mail*)—Two distinct shows will be staged by the French automobile industry next fall. The first exhibition, which will open in the Grand Palais, Paris, on Oct. 4 and close on Oct. 10, will be devoted to passenger cars, bicycles and motorcycles, together with their accessories.

Ten days later, on Oct. 24, an exhibition of trucks, agricultural tractors, stationary engines, etc., will be inaugurated in the same hall and will remain on view until Nov. 2.

The exhibitions will be international and will be under the management of Henri Cezanne.

BREVITIES FROM SHOW

Contrary to the usual custom, the show was not complete when the doors of Grand Central Palace were opened Saturday afternoon. More than forty cars were held up in transit between Albany and New York City and did not reach the building until evening. Lexington was late with its complete exhibit, while Oldsmobile, Anderson, Paterson and Maxwell were involved in the railroad mixup.

Dealers say they will devote most of their efforts to selling closed cars during the new year as the type most suited to meet the combined needs of owners. The open models, they declare, are becoming more and more a choice only of those who can afford two cars or who live in sections where closed car operation is inadvisable.

Sid Black had fitted up a Cleveland with a radio apparatus for a show feature, but Sam Miles refused to let him use it after he had got it in the building. Black, consequently, tried something else. The engine of the cutout chassis is operated by some mysterious power which Black will not divulge and which attracts about as much attention as the radio would have done.

News came to the show of the death in El Cajon, Cal., of J. Elmer Pratt, one of the pioneers of the industry who passed away after an illness which had lasted several years. Pratt came from the bicycle era, in which he was identified with G. & J. and Clipper. He was associated with W. E. Metzger in the early Cadillac days, and from there went to Flint with W. C. Durant and Buick. After that he was sales manager of Pierce-Arrow for seven years. Starting for himself, he organized the Hygrade Motors Co. of Grand Rapids, Mich., manufacturing trucks.

Durant officials journeyed to the Elizabeth plant on Wednesday to inspect the plant and enjoy a luncheon given in celebration of the thirty-sixth anniversary of F. W. Hohensee's affiliation with W. C. Durant. Hohensee is president and general manager of the Durant Motor Co. of New York and chief engineer of the Lansing, Leaside, Long Island and Elizabeth plants. Later he is expected to assume the presidency of the New Jersey company, so the big corporation decided to open the Elizabeth plant formally on the anniversary. A special train carried the Durant officials and other invited guests.

"The word 'speed' should be eliminated from all advertising copy," says C. C. Winningham, advertising counsel for Hudson and Essex. "I have cut it out of my vocabulary. Shouting about speed is very likely to stir up the legislators, and the first thing we know they will be insisting on us putting governors on the cars."

Ford Motor Co. is planning the biggest year's business for Lincoln that it has ever had, and another year will find this car arriving at the production point that the Ford executives have contemplated from the start.

Reo went into the show without any cars in stock, while no distributor had more than a month's supply of cars on hand. December business was 100 per cent over December, 1921, and the Reo representative in Chicago did three and one-half times the business this December than in the preceding December. A factory expansion is taking place at Reo, which is building a new shipping room and storage warehouse, adding 300,000 sq. ft. to the storage warehouse.

From the time it announced its new series on Aug. 1, 1922, and up to Jan. 1, the Buick Motor Co. shipped 76,909 cars, far exceeding the original schedule. Friday, Dec. 29, was the biggest manufacturing day in Buick history, when 1226 cars were shipped and driven away, surpassing the previous best record of 1029, made Oct. 28. In the last week of the old year six trainloads of Buicks—more than 600—were shipped into New York City.

Many dealers attending the show said they had come to sign up new lines, but first wanted to have a look at the factory executives and talk to them personally so they would know just the kind of men they were going to do business with.

"Oldsmobile Show News," a four page newspaper is issued daily from the Oldsmobile booth at the show. It is well illustrated with cartoons and pictures, covers the show in general, prints news happenings of particular interest to Oldsmobile dealers and publishes a guide to New York, with a list of attractions at the theaters. The paper is well edited and each issue carries one editorial.

The appearance of the two new Wills Sainte Claire models is declared by Wills men to mark the initiation of a manufacturing policy that will place the car in a strong position in its class. December was declared to have been a bigger Wills month than July and one of the biggest of the entire year.

Makers and Dealers Meet at Luncheons

Companies Hold Social Gatherings During Holding of Show in New York

NEW YORK, Jan. 10—Pierre S. duPont, president of General Motors, told Oldsmobile dealers at their dinner here to-night that it was the ambition of General Motors to bring Oldsmobile to third or fourth place in the country's production of passenger cars.

A. B. C. Hardy, president and general manager of the Olds Motor Works, told the distributors and dealers present not to make transactions involving used cars unless they could do so without loss.

Hardy spoke in a complimentary way of used car cooperative plans in operation in some cities and suggested that where dealers find an opportunity to "sit down with some other clean fellows and look the used car situation squarely in the eye," they do so and "let the fellow who is willing to make long trades take all he can get; he will go out of business just so much sooner."

In making an address to the 1500 Dodge Brothers dealers at the company's regular show week meeting and luncheon, President Fred J. Haynes said that the company has selected for manufacture "the types of cars that the public needs every day in the year, so that we can manufacture every day in the year and dealers can sell every day in the year."

Oakland Meeting

More than 200 dealers in the district controlled by the New York branch attended the luncheon of the Oakland Motor Car Co. at the Commodore, presided over by C. M. Brown, New York branch manager. In attendance also were five of the chief executives of General Motors including Pierre duPont, A. P. Sloan, Jr., John J. Raskob, C. S. Mott and C. F. Kettering.

Buick branch managers and distributors were the guests of E. T. Strong, general sales manager, at a luncheon conference in the Commodore at which business for the past five months was reviewed and that for the next seven of the company's fiscal year was planned. To the first of the year 77,000 of the new model have been shipped or driven away from the Flint and Detroit plants. Demand was in excess of this total, Strong said.

Five hundred Franklin dealers were guests of the company at a luncheon and business meeting in the Commodore, at which speeches were made by S. E. Ackerman, sales manager of the company, and S. R. Latshaw, a vice-president of the Butterick Co. A cablegram from H. H. Franklin was read, in which he expressed his regrets at his inability to attend and extended his best wishes for business in 1923.

EXECUTIVES IN ATTENDANCE AT SHOW

American—Carl H. Page, president; Proctor Hansl, vice-president; Robert Bursner, chairman; J. J. Paul, production manager; Wallace Hood, commercial manager of the Board of Directors, and W. B. Harding, assistant to president.

Anderson—J. W. Anderson, president; W. A. Anderson, vice-president, and E. Z. Jones, sales manager.

Apperson—N. H. Van Sicklen, vice-president and general manager; H. F. Carlin, comptroller, and E. M. Lubeck, general sales manager.

Auburn—A. P. Kemp, president and treasurer; J. I. Farley, first vice-president and director of sales, and R. H. Faulkner, sales manager.

Barley—A. C. Barley, president and general manager, and William Elliott Phelps, general sales manager.

Buick—H. H. Bassett, president; E. T. Strong, general sales manager; C. W. Churchill, director of sales; A. B. Batterson, advertising manager, and Harry Daniels, publicity director.

Cadillac—H. H. Rice, president; Lynn McNaughton, general sales manager; J. W. Dunivan, distribution manager; H. M. Stephens, distribution manager, and Verne E. Burnett, advertising manager.

Chandler—F. C. Chandler, president; G. M. Graham, vice-president; Samuel Reger, treasurer; Hiram Walker, engineer; Frank E. Connor, sales manager, and H. L. Hubbard, chassis engineer.

Chevrolet—Colin Campbell, general sales manager; C. E. Dawson, assistant sales manager; C. B. Baldwin, manager service, and G. F. Lord, advertising manager.

Cleveland—J. V. Whitbeck, president; Sid Black, vice-president; E. Wooler, chief engineer; W. B. Westcott, sales manager, eastern division; A. C. Clemonson, district representative; J. N. Nicholson, service manager; W. G. LeFever, district representative; W. L. Welch, district representative, and R. C. Hodge, purchasing agent.

Columbia—J. G. Bayerline, president and general manager; William E. Metzger, vice-president; A. T. O'Connor, secretary-treasurer; D. J. Willoughby, sales manager; W. L. Daly, vice-president in charge of sales, and Waldo E. Fellows, advertising manager.

Courier—A. C. Burch, president; R. S. Ellis, special representative; F. S. Spring, chief engineer, and W. W. Jeffrey, assistant sales manager.

Crawford & Dagmar—Herbert M. Ross, general manager.

Davis—George W. Davis, president, and Walter C. Davis, secretary and sales manager.

Dodge Bros.—F. J. Haynes, president and general manager; C. W. Matheson, vice-president in charge of sales; John A. Nichols, Jr., general sales manager; C. H. Jennings, assistant general sales manager; John H. Gordon, director of distribution; R. N. Harger, advertising manager, and George H. Phelps, advertising counsel.

Dorris—G. P. Dorris, president; J. T. Rumble, sales manager, and W. A. Chapman, director of sales.

Dort Motor Car Co.—J. D. Dort, president; J. D. Mansfield, general sales manager, and E. G. Poxson, assistant sales manager.

Durant—W. C. Durant, president; Carroll Downes, vice-president; M. B. Leahy, general sales manager; J. H. Newmark, manager sales promotion; M. F. Bradley, director of publicity, and A. T. Sturt, chief engineer.

Earl—George C. Scobie, president; W. E. Stalnaker, general sales manager, and D. M. Shaw, assistant general sales manager in charge of advertising.

Elcar—F. B. Sears, president; W. H. Denison, vice-president; W. H. Patterson, vice-president, treasurer and sales manager, and A. M. Graffis, secretary and chief engineer.

Fox—Ansley Fox, president; F. C. Van Derhoof, general sales manager; G. H. Paddock, assistant sales manager; H. L. Archey, assistant sales manager, and Frank H. Golding, treasurer and general manager.

Franklin—S. E. Ackerman, sales manager; G. A. Hoyt, assistant sales manager; H. H. Goodhart, advertising manager; A. M. Taylor, assistant advertising manager; L. M. Stellman, chief engineer; F. J. Leyerle, service manager; W. H. Kemp, general district manager; E. L. Van Buren, district manager.

Gardner—Russell E. Gardner, Jr., vice-president for sales; Fred W. Gardner, vice-president for production; W. H. Yeldell, sales and advertising manager; W. N. Albee, advertising counsel; E. A. Weber, chief engineer, and Alan Leamy, district sales representative.

Gray—F. L. Klingensmith, president; D. Henry Bonner, sales manager; F. F. Beal, vice-president, and R. Stahl, engineer.

H. C. S.—Harry C. Stutz, president and general manager; R. E. Maypole, vice-president; A. G. Murdock, secretary and Frank B. Willis, sales and advertising manager.

Hatfield—L. I. Hatfield, president; H. M. Hatfield, secretary, and C. P. Dewitt, sales manager.

Handley—James I. Handley, president; George C. Morgan, sales manager; R. J. Fitness, superintendent; J. H. Conklin, purchasing agent, and S. A. Sprinkle, mechanical department.

Haynes—Elwood Haynes, president; Alton G. Seiberling, vice-president and general manager; Gilbert U. Radoye, director of sales and advertising; Walter P. Hanson, advertising manager; Frank N. Nutt, chief engineer, and Leonide Barreri, eastern district sales manager.

Hudson—Roy D. Chapin, president; O. H. McCornack, vice-president in charge of sales; H. G. Moock, sales manager; J. S. Draper, assistant sales manager, and W. A. James, advertising manager.

Hupmobile—C. D. Hastings, president; O. C. Hutchinson, sales manager; Frederick Dickinson, advertising manager; F. B. Sides, assistant sales manager; C. E. Salisbury, service manager, and J. H. Teagen, export manager.

Jordan—Edward S. Jordan, president, Paul Zens, secretary and treasurer; W. B. Riley, sales manager; Russell S. Begg, chief engineer; Jay H. Kelley, factory manager; Ralph O'Reilly, assistant sales manager; W. J. Gallagher, assistant sales manager, and S. R. Thomas, assistant chief engineer.

King—A. Weber, president; H. Alperin, general manager; J. B. Coker, special sales representative.

Kissel—G. A. Kissel, president; W. L. Kissel, secretary and treasurer, and J. F. Lynch, director of sales.

Lafayette—D. F. Edwards, vice-president; E. C. Howard, vice-president, and Donald B. Skinner, advertising manager.

Lexington—Frank B. Ansted, president and general manager; C. C. Hanch, executive vice-president; Emery Huston, vice-president and advertising manager; R. T. Middleton, sales manager and C. H. Beaumont, service manager.

Liberty—Percy Owen, president; D. E. Williams, treasurer; George Allen, chief engineer, and Cliff Noble, advertising manager.

Lincoln—R. C. Getzinger, sales manager.

Locomobile—W. C. Durant, president; C. F. Daly, vice-president; E. H. Havens, vice-president; E. A. Travis, general sales manager, and D. G. Roos, works manager and chief engineer.

Macfarlan—A. H. Macfarlan, president; B. M. Barrows, secretary and treasurer, and Paul Barrows, sales manager.

Marmon—W. C. Marmon, president; H. C. Marmon, vice-president; H. H. Rice, secretary; H. H. Brooks, sales manager, and H. L. Peterson, assistant sales manager.

Maxwell-Chalmers—W. R. Wilson, president; A. E. Barker, vice-president in charge of sales; J. J. Plath, director of sales; J. E. Fields, director of sales; W. J. Mattimore, advertising manager, and A. T. Stanton, director of service.

Mercer—R. N. Barnum, president; W. A. Smith, vice-president and sales manager; Walter Haines, experimental engineer, and C. H. Saidt, assistant sales manager.

Mitchell—J. T. Tainsh, general sales manager; P. J. Batenberg, chief engineer; T. H. Smith, sales promotion manager, and W. C. Rohde of the engineering department.

Moon—Stewart McDonald, president; Stanley Moon, secretary; F. H. Rengers, general sales manager; George H. Kublin, chief engineer; N. E. McDarby, advertising manager, and E. H. Serrano, export manager.

National—T. W. Brandle, vice-president in charge of merchandising; Carl B. Excelsen; W. I. Ohmer; C. G. Peck, sales manager of the traffic truck division; Antonio Alvarez, export manager; Alvin Gloetzner, formerly president of Covert Gear; C. L. Halladay, chief engineer; Harry Unwin and George Dickson of the old National and R. C. Wine.

Noma—Frank Ammann, general manager.

Oakland—George Hannum, president and general manager; C. J. Nephler, sales and advertising manager; R. A. Armstrong, service manager; W. R. Tracy, assistant sales

(*Continued on page* 108)

OWNER DEVELOPMENT NEEDED, SAYS FORD

DETROIT, Jan. 9—In a statement in which he declares that automobile business this year should be better than ever before, Edsel Ford, president of the Ford Motor Co., says:

"It is to be a case of survival of the fittest. The demand is coming from a more concentrated sales effort on the part of manufacturers and dealers. There are hundreds of thousands of potential owners who have yet to buy their first cars.

"Dealers and manufacturers have been content to skim the cream off the market and now are engaged in trading rather than in developing new car owners.

"Recent price reductions on Ford products in the face of the heaviest demand ever known came as a natural result of savings through constantly increasing production."

Jordan Starts Year Minus Indebtedness

Plant Equipped for 80 Cars Daily Although Only 40 Are Scheduled Now

CLEVELAND, Jan. 8—The Jordan Motor Car Co. started production today fully equipped for a peak production of 80 cars a day. In 1922 the volume of cars that went from this factory aggregated 8000.

Larger production is made possible without the addition of a new building and with an actual increase in available floor space in the present plant through the introduction of the conveyor system for handling the chassis, and the adoption of the overhead method for bodies.

The company finished 1922 with a balance sheet clean of all indebtedness and a substantial surplus with which to begin the new year. Production in 1922 was valued at $12,000,000, and it was effected on $1,200,000 capital with a running inventory of $700,000. In spite of the fact that the capacity of the plant will be 80 cars a day, a conservative schedule for 1923 is planned, calling for an average of 40 cars a day throughout the year.

Willys Bought Overland 15 Years Ago for $350

NEW YORK, Jan. 8—John N. Willys, president of the Willys-Overland Co., today celebrated the fifteenth anniversary of his purchase of the Overland company, the control of which he gained on Jan. 8, 1907, for the sum of $350. Willys referred to the anniversary at a luncheon given to New York newspaper men today by Ward Canaday, Overland advertising counsel.

At the time of the purchase Willys was the Overland dealer in Elmira, N. Y. He had been a hustler and had sold 500 cars. The factory could not deliver, so he went to Indianapolis to find out why. This was during the panic when money was scarce and even the banks were issuing scrip. At Indianapolis Willys found the company in bad shape, not even being able to meet the payroll the next day.

Willys did not have the money himself but he scouted around and raised it among his friends. It saved the day and gave Willys an opportunity that he was not slow to follow up. He found the company owed $80,000 and was broke. A friend promised him $15,000, but produced only $7,500, but with this sum Willys put the organization on its feet.

NATIONAL LATHE RECEIVERSHIP

CINCINNATI, Jan. 10—Upon application of Charles Reedy, president and treasurer of the National Lathe Co., manufacturer of engine lathes, Paul Stewart has been appointed receiver for the company by the Common Pleas Court.

It is said that the company has on hand a large stock of parts and tools which, if disposed of in the regular course of business will net a substantial profit, and that its assets are about $20,000 in excess of liabilities. Inability to convert these assets into money, slow collections and lack of sufficient credit were given as the cause of Reedy's action.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

Considerable ease developed in the call money market last week soon after the large interest and dividend payments incident to the first of the year had been made. Funds were in liberal supply and quotations ranged between 3½ per cent and 5½ per cent, as compared with 4½ per cent to 6 per cent in the preceding week. The market for fixed date maturities was comparatively quiet. Quotations for all maturities from 60 days to 6 months were 4½ per cent to 4¾ per cent, as compared with 4¾ per cent to 5 per cent in the preceding week. The prime commercial rate remained unchanged at 4½ per cent to 4¾ per cent.

Pig iron production for December totaled 3,086,298 tons, the largest output since October, 1920, 8.3 per cent more than November's production and 87.1 per cent more than production in December, 1921. The average daily output during December, 1922, amounted to 99,577 tons, an increase of 4587 tons over the November average. The total production for the entire year of 1922 was 26,879,783 tons. This was 62.4 per cent more than the output for 1921, but 31.1 per cent less than the 1916 record production.

Class I railroads reported net operating income of $78,860,500 for the month of November, which represents a return on an annual basis of 4.46 per cent. This compares with the net operating income of $85,254,000 and an annual return at the rate of 4.05 per cent for October and $66,884,000, or 3.79 per cent, for November of last year.

Germain Returns; Dunlop Plant Shows Activities

BUFFALO, Jan. 8—President Edward B. Germain of the Dunlop Tire & Rubber Co., who returned from England last week, has gone to New York City for a conference in the offices of the company there. He will return to Buffalo at an early date.

Activities are noticeable at the plant where 125 men are preparing the buildings and machinery for the fabrication of automobile tires. It is understood that Germain will form his organization soon after he comes back to Buffalo, but when production will begin has not been announced.

FINANCIAL NOTES

N. H. Canfield, receiver for the Standley Manufacturing Co., Boone, Iowa, has issued a statement as of Sept. 25, 1922, showing total assets of the company to be $14,281 inclusive of the following items: Cash on hand and in bank, $614; inventory, $4,562; and accounts receivable less accounts uncollectable, $6,420. The liabilities are given as $29,144, including notes payable, preferred claim, $22,650; and accounts payable, $4,157. In the statement the receiver refers to a proposed contract by which the Gladiator Manufacturing Co. would manufacture the Standley products. Under this contract the Gladiator company would pay Standley 5 per cent on gross sales until the debts were paid.

General Tire & Rubber Co., under new charter provisions, has reduced the par value of its common stock from $100 to $50 a share. Coming on top of the declaration of a 100 per cent stock dividend this does not alter the total capitalization of the company. Under the new plan each share of common stock of $100 par value is transferable for 4 shares of common stock of $50 par value each. In addition to the 100 per cent stock dividend the company has declared its quarterly dividend on common stock, on a basis of 6 per cent annually, payable Feb. 1 to stock of record Jan. 20. This is the equivalent of 12 per cent net on the original shares of stock of $100 par each held by shareholders.

General Motors Corp. directors at their meeting in New York on Jan. 8 declared the regular quarterly dividends as follows: 6 per cent preferred, $1.50 a share; 6 per cent debenture, $1.50 a share; 7 per cent debenture, $1.75 a share. These dividends are all payable Feb. 1, 1923, to stockholders of record at the close of business Feb. 18, 1923.

Hupp Motor Car Co. directors have recommended an increase of 10 per cent in capital stock to its stockholders for the purpose of declaring a 10 per cent stock dividend on the $5,192,100 outstanding common stock (par $10). The regular quarterly dividend of 25 cents a share on common stock has been declared, payable Feb. 1.

Pierce-Arrow Motor Car Co. practically has about completed arrangements by which it will permanently finance its bank loans of approximately $8,000,000. It is understood the new financing will take the form of two bond issues. One of $4,000,000 in first mortgage 6 per cent, the other $4,000,000 of 8 per cent debentures.

American Rubber & Tire Co. of Akron, has declared a dividend at the rate of 8 per cent on outstanding preferred stock for the quarter ending Dec. 31, payable Jan. 1. This is the twenty-seventh consecutive dividend declared on preferred stock.

Fisher Body Co. has declared the regular quarterly dividends of 1¾ per cent on the preferred and $2.50 a share on the common, both payable Feb. 3 to stock of record Jan. 20.

Kelsey Wheel Co., Inc., has declared the regular quarterly dividend of $1.75 a share on its preferred stock, payable Feb. 1 to holders of record Jan. 20.

United States Rubber Co. has declared a regular quarterly dividend of $2 a share on preferred stock, payable Jan. 31 to stock of record Jan. 15.

Mullins Body Corp. has declared the regular quarterly dividend of $2 a share on the preferred stock, payable Feb. 1 to holders of record Jan. 18.

Road Board Outlines Its Year's Program

Will Expand Educational Work—Meeting with Representatives of Industry

NEW YORK, Jan. 8—A program for the year's work of the Highway Education Board was outlined at the meeting, which began here yesterday. The general educational activities will be divided into four parts, as follows:

Continuation of the work of the various committees with particular reference to subdividing the work of the committee on content of courses in English and supporting non-technical subjects.

The relation of the committee on teaching highway traffic regulations in colleges to the Eno Foundation and other similar organizations.

Recommendation to colleges to give lectures on the sociological aspects of highway transport, their preparation and distribution.

More general use of short courses and conferences on highway engineering.

Research Recommendations

Recommendations regarding research which will be suggested to the director of the Highway Advisory Board of the National Research Council will include highway economics and highway sociology in metropolitan and urban highway and highway transport problems; cooperative studies between representatives of motor trucks and the railroads; highway finance and highway legislation with special reference to uniformity of acts.

The Highway Education Board held a joint conference today with the highway committees of the National Automobile Chamber of Commerce and the Society of Automotive Engineers together with research officials.

The sessions of the Board in this city were preceded by conferences Thursday and Friday between the N. A. C. C. Conference Committee and a Committee representing the American Association of State Highway Officials. At these meetings further progress was made in arriving at a thorough understanding of the purposes of each organization and placing the work proposed on a cooperative basis so far as possible.

Hatt Program Adopted

One of the most important forward steps yet taken in relation to highway research was the adoption by the different interests involved of a definite program outlined by Prof. W. K. Hatt, director of the advisory board on highway research of the National Research Council.

The representatives of the S. A. E. and the N. A. C. C. agreed to undertake the work he had outlined. The first step, at the suggestion of Chief McDonald of the Bureau of Public Roads, will be a concerted attempt, in co-operation with the Bureau of Roads, to determine the loads imposed on road surfaces by various vehicles, with various tire equipment, at various speeds.

INDUSTRIAL NOTES

Sprague Tire & Rubber Co., Omaha, re-elected its board of directors at the annual meeting of stockholders. The directors are as follows: E. H. Sprague, John Rosenstock, W. A. Fraser, Francis Ferns and F. H. Gaines. President Sprague presented the balance sheet for the year which showed a good profit. It was stated that prospects for 1923 business are excellent, with more than twice as much business booked as a year ago and the mill operating at capacity.

Steam Automotive Works has been reorganized as the Stokesbary Steam Motors Co. and all its business will be moved from Denver to Los Angeles, where plans call for the erection of a factory in the near future. J. H. Stokesbary is president of the company.

Hampden Auto Top & Metal Co. has bought the four-story building it occupies in Springfield, Mass., and purposes to enlarge by adding another story. Considerable increase of production is planned for 1923.

Sanford Is Producing 1½-Ton Speed Truck

SYRACUSE, N. Y., Jan. 10—The Sanford Motor Truck Co. of this city is starting production on a 1½-ton speed truck. The engine is a Continental 8-R, six-cylinder, 3⅜ by 4½ in. It forms a unit with a single-plate dry-disk clutch and a three-speed gearset. The rear axle is a three-quarter floating type with spiral bevel gears. The ratio is 5.75 to 1. The wheelbase is 140 in. and the tires are 33 by 5 in. pneumatic.

The following bodies are furnished: Open express at $1,855, covered express $1,930, and rack section $1,955. Regular equipment includes cab.

Haynes Now Preparing New Six-Cylinder Car

NEW YORK, Jan. 8—The Haynes Automobile Co., planning ahead, announces that Chief Engineer Frank Nutt is working on a new and small six-cylinder job which the company expects to market at about $1,000 for the open model and $1,500 for the closed. This will not be ready until about June and it will be a big production car. No details of construction are given out.

With the addition of this model to the line, the company will find it necessary to prepare for factory expansion.

NEW DAVIS BROUGHAM

RICHMOND, IND., Jan. 10—The Davis Motor Car Co. will bring out a new model 76 five-passenger brougham about Feb. 1. This will be mounted on the model 70 chassis and will be priced at $1,595.

METAL MARKETS

While all but the leading sheet producers are seeking to "sweeten" first quarter averages by tacking on the Corporation's prices, premiums, ranging from $1 to $6 a ton, these quotations so far fail to denote an actual market advance, entailing rather the idea of special compensation for deliveries to accommodate tardy buyers. Unquestionably, however, leading independents are seeking to lift sheet prices to higher levels, and it remains to be seen what course the chief interest will pursue. The demand for sheets in comparison with that for most other steel products is such as to give sellers the edge.

It is well known, however, that the leading interest's program at this time aims at price stabilization rather than at taking advantage of a temporary excess in the demand for any one product over the supply. It is this restraining influence which is again to the front in the sheet market, where several important independents have declared themselves unwilling to accept further orders at prevailing levels. The most prominent independent producer of full-finished sheets in the Mahoning Valley placed three additional units in commission this week, giving the company 13 mills in operation for the production of automobile sheets, with work on five more being hurried to completion. This producer has a sufficient backlog of orders to await further market developments.

Non-integrated rollers of automobile sheets apparently have covered their sheet bar requirements for the current quarter, the bulk of it at $36.50, as virtually no business has so far been done at the $38.50 level named recently by independent sheet bar mills. No change, but brisk automotive demand is to be noted in the market for hot- and cold-rolled strip steel. Specifications are coming in freely against existing contracts. Similar conditions are reported by makers of cold-finished steel bars. Routine conditions prevail in the market for bolts and nuts. Makers report booking a constant quota of first quarter business at regular prices, with specifications sufficiently liberal to maintain a very fair rate of operations. Alloy steel makers also express themselves as well pleased with the amount of business and tentative inquiries coming to them from the automotive industries. The 1923 steel market has gotten under way in a manner highly gratifying to steel producers.

Pig Iron.—Predictions of further advances in the pig iron market are freely indulged in by blast furnace interests. The momentum which has carried the market from its $25 low to the prevailing $27, valley, quotation is considered by sellers to retain sufficient strength for further advances. Stabilization of the pig iron market apparently is as far off as ever. Buyers are either in the market by droves or not at all. Most of the automotive foundries have covered their first quarter wants, but a certain amount of single car business continues.

Aluminum.—The market is quiet and of a routine character. The domestic producer is reported to be booked far ahead with sheet orders from the automotive industries.

Copper.—Somewhat quiet conditions prevail in the market for electrolytic copper, but the tone is steady, most of the producers asking 14.75 cents, delivered. Copper and brass mills in the Waterbury district are working with as large forces as the labor supply permits, and much of the product turned out is of an automotive character.

Calendar

SHOWS

Jan. 27-Feb. 3—Chicago, Annual Automobile Salon.

Jan. 27 - Feb. 3 — Chicago, National Automobile Show, under auspices of National Automobile Chamber of Commerce, Coliseum and First Regiment Armory.

FOREIGN SHOWS

Jan. 13-24 — Brussels, Sixteenth International Automobile and Cycle Exposition, Palais du Conquantenaire.

April - July, 1923 — Gothenburg, Sweden, International Automobile Exhibition, Sponsored by the Royal Automobile Club of Sweden.

Oct. 4 - 10 — Paris, Passenger Cars, Bicycles, Motorcycles and Accessories, Grand Palais.

Oct. 24-Nov. 2—Paris, Trucks, Agricultural Tractors, etc., Grand Palais.

RACES

May 10 — Berlin - Grunewald, German Grand Prix.

July 2 — Tours, French Grand Prix 500-mi. race.

CONVENTIONS

Jan. 15-19—Chicago, Thirteenth American Good Roads Congress and Fourteenth National Good Roads Show.

Jan. 29 - 31 — Chicago, Annual Meeting, Automobile Electric Service Association, Congress Hotel.

Feb. 8 - 9 — Chicago, City Club, Winter Sectional Meeting of the American Society for Steel Treating; W. H. Eisenman, 4600 Prospect Avenue, Cleveland, national secretary.

Feb. 15 - 16 — Chicago, National Association of Taxicab Owners, Hotel Sherman.

April 25, 26 and 27—New Orleans, Annual Convention of the National Foreign Trade Council.

S. A. E. MEETINGS

Metropolitan Section

March 15—Speaker, William P. Kennedy, President, Kennedy Engineering Corp.; Subject, Trolley Buses and Flexible Vehicles for Street Railway Service.

April 19—Speaker, Edw. E. La Schum, General Superintendent, Motor Vehicle Equipment, American Railway Express Co.; Subject, Engineering Features of Fleet Operation.

May 17—Speaker, F. P. Gilligan, Secretary, Henry Souther Engineering Co., Subject, Metallic Materials for Automotive Work.

Other Meetings

Jan. 31 — Chicago Meeting and Dinner of the Society at the Congress Hotel.

Kerosene Price Rise Explained to Senate

WASHINGTON, Jan. 8—Intensity of competitive conditions in various localities of the country caused the wide variance in wholesale gasoline and kerosene prices last spring, Howard Wilkinson, director and chief of the domestic trade of the Standard Oil Co. of New York, told the Senate Manufacturing Sub-committee investigating gasoline and crude-oil prices.

The investigation of the committee during the past week has been devoted largely to kerosene prices and their relation to gasoline prices. Wilkinson was asked to explain the price fluctuations of kerosene in four cities served by the New York company.

On May 31, 1922, the price of kerosene in Buffalo was 14 cents a gallon; in Rochester, N. Y., 11 cents; in New York, 13 cents, and in Boston, 13 cents, according to committee records. Three months later, Aug. 30, the Rochester price had jumped to 15 cents a gallon, while the price in the other cities remained the same as for May.

The four-cent advance in Rochester, the Standard Oil official explained, was due to elimination of certain competition.

Many Plant Executives Attend New York Show

(*Continued from page* 105)

manager and E. M. Orr, assistant general manager.

Oldsmobile—A. B. C. Hardy, president; G. H. Peasley, sales manager; Thomas O'Brien, assistant sales manager; E. J. Shassberger, advertising manager and E. J. McMullen, show director.

Overland—John N. Willys, president; L. G. Peed, sales manager; E. H. Belden, assistant to president; A. J. Baker, chief engineer; L. A. Miller, secretary; F. A. Judson, vice-president, and O. P. Kilbourn, sales promotion.

Packard—Alvan Macauley, president and general manager; J. G. Vincent, vice-president in charge of engineering; H. H. Hills, vice-president in charge of sales; R. E. Chamberlain, sales manager; H. N. Davock, service manager, and R. D. Hughes, acting advertising manager.

Paige-Detroit Motor Car Co.—H. M. Jewett, president; H. Krohn, vice-president in charge of sales; C. B. Gaunt, sales manager; W. K. Towers, advertising manager, and F. W. Bowen, service manager.

Paterson—W. P. Mallon, eastern sales representative.

Pierce-Arrow—M. E. Forbes, president; R. O. Patten, truck sales manager; L. E. Corcoran, passenger car sales manager; E. H. Rounds, advertising manager; T. J. O'Rourke, sales representative, and C. L. Hodge, publicity department.

Pilot—George E. Seidel, president; Joseph W. Conner, general sales manager; Frank X. Spenger, purchasing agent, and W. H. Conklin, advertising manager.

Premier—Frank S. Strattan, president.

R. & L.—H. H. Doering, sales manager.

R. & V.—H. A. Holder, president and general manager; D. M. Beal, sales manager, and Lawrence Boogher, secretary and treasurer.

Reo—R. E. Olds, president; D. E. Bates, secretary and treasurer; H. C. Teal, factory manager; R. C. Rueschaw, sales manager; C. A. Triphagen, assistant sales manager; H. T. DeHart, advertising manager, and H. T. Thomas, chief engineer.

Rickenbacker—E. V. Rickenbacker, vice-president in charge of sales; W. J. Drumpelmann, sales manager, and E. Le Roy Pelletier, advertising manager.

Rotary Six—Eugene Bournonville, president; R. V. Bournonville, in charge of motor testing, and C. F. Smith, chief engineer.

Stanley—Frank Jay, president, and Prescott Warren, vice-president.

Star—R. H. Mills, in charge of show.

Stearns—G. L. Booker, general sales manager, Nelson Noyls, assistant sales manager and traffic manager.

Stephens—R. W. Lea, vice-president and general manager; H. J. Leonard, vice-president in charge of manufacturing; O. P. Robb, vice-president in charge of sales, and E. G. McDonald, chief engineer.

Studebaker—A. R. Erskine, president; H. A. Biggs, vice-president in charge of sales; H. B. Harper, sales manager; G. W. Sweet, assistant sales manager, and W. E. Betts, advertising manager.

Velie—W. L. Velie, president; F. E. Bradfield, vice-president and general manager; W. L. Velie, Jr., secretary; H. S. Lord, sales director; T. G. Gannon, sales manager, and W. T. Wheelock, advertising manager.

Westcott—B. J. Westcott, president; E. H. Gilcrest, vice-president and general sales manager, and K. A. Heinzen, advertising manager.

C. H. Wills & Co.—C. Harold Wills, president; E. C. Morse, general sales manager, and C. L. Jacobson, sales representative.

Body Makers Report Shortage of Labor

PHILADELPHIA, Jan. 8—Philadelphia automobile bodymaking and assembling plants are exceedingly busy and report a shortage of skilled workmen. The American Motor Body Co., operating the old Hale & Kilburn plant, has been compelled to train men for its upholstering and trimming department, in order to overcome the scarcity of labor.

Owing to the seasonal decline in outdoor construction, many woodworkers and cabinet makers have accepted indoor work at the American Motor Body Co. plant, which is producing more than 200 bodies a day. The company also is engaging as many skilled painters, varnishers, trimmers and woodworkers as it can find, and although 1600 men are already at work, it is endeavoring to find a total of 2200. It has adopted the policy of employing women in upholstering and trimming.

C. W. Wright, superintendent of the Ford Motor Co. assembling plant says the present labor supply is inadequate. The present force is about 800 men, the smallest number engaged in two years. It is hoped to have 1000, the peak number, at work here by spring.

A manufacturer of commercial electric trucks has sufficient orders to keep its present force, the largest in its history, busy for at least three months.

VINCENT HURT WHILE SKIING

NEW YORK, Jan. 11—Jesse G. Vincent, vice-president of engineering of the Packard Motor Car Co., here in attendance at the show, met with an accident Sunday which sent him into retirement for several days.

While skiing over the icy hills of the Scarsdale Golf Club with Harold Slauson of the Kelly-Springfield Tire Co., Vincent stumbled and when picked up he was found to have broken a small bone in his left leg at the ankle. Two days' rest with the leg in a plaster cast was necessary before the Packard man could even get out of doors again.